Lowndes County Natural Hazard Mitigation Plan

Draft
May 2006

Adopted by:
Lowndes County Commission, xxxx
Town of Benton, xxxx
Town of Fort Deposit, xxxx
Town of Gordonville, xxxx
Town of Hayneville, xxxx
Town of Lowndesboro, xxxx
Town of Mosses, xxxx
Town of White Hall, xxxx

FEMA Approved On:
xxxx

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Additional copies of the Lowndes County Natural Hazard Mitigation Plan are available by contacting:

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I. PURPOSE AND PROCESS

Natural hazard mitigation is the process of reducing or eliminating the loss of life and property damage resulting from natural disaster events. This process begins with the hazard mitigation plan in which hazards are identified and analyzed to determine their potential impact on a community or region and steps are outlined to avoid or minimize the undesired effects. The purpose of the hazard mitigation plan and planning process is the resulting mitigation strategy, which outlines a coordinated implementation of action steps with as little conflict and/or duplication of efforts as possible by the responsible agencies.

The Lowndes County Natural Hazard Mitigation Plan is multi-jurisdictional in scope, covering Lowndes County in its entirety including the unincorporated areas and the municipalities of Benton, Fort Deposit, Gordonville, Hayneville, Lowndesboro, Mosses, and White Hall. Thus, this plan has been reviewed and has been approved (or considered) by the County Commission and the seven municipal governments located within the county. During the planning process, the following three goals were established to guide mitigation efforts:

- Promote natural hazard mitigation as a means to decrease loss of life, property damage, and economic loss during a disaster occurrence.

- Provide on-going support of the Lowndes County Emergency Management Agency's (EMA) efforts to make Lowndes County less vulnerable to natural disasters.

- Educate the general population about natural hazards and hazard mitigation options.

To develop the Lowndes County Natural Hazard Mitigation Plan, the Lowndes County Local Emergency Planning Committee (LEPC) was utilized as an oversight committee to guide the development of the plan and lend individual expertise to the planning process. The Lowndes County LEPC is a standing committee comprised of 50 active members representing emergency services, the County Commission, each of the seven municipal governments, law enforcement, medical/healthcare services, utilities, education, business and industry, forestry, agriculture, social services, civic and

religious groups, and the media. The plan was developed using a ten-step process outlined by the Federal Emergency Management Agency. LEPC meeting and public workshop/meeting summaries are available from the Lowndes County EMA upon request.

Figure 1

Hazard Mitigation
10-Step Planning Process

Step 1:	Organize
Step 2:	Involve the Public*
Step 3:	Coordinate with Agencies and Organizations*
Step 4:	Assess the Hazard
Step 5:	Assess the Problem
Step 6:	Set Goals
Step 7:	Review Possible Activities
Step 8:	Draft an Action Plan
Step 9:	Adopt an Action Plan
Step 10:	Implement, Evaluate and Revise**

* Step 2 and Step 3 are continuous throughout the process.

** Upon evaluation and revision, the process should begin again at Step 2. Evaluation and revision of the plan should occur at least every five years.

During the course of the planning process, the Local Emergency Planning Committee (LEPC) met on five occasions to discuss progress and provide information and comments. Each LEPC meeting was open to the public. Additionally, two general public workshops were held to educate the general public about the hazard mitigation plan and its contents and recommendations, and to hear citizens' comments and suggestions. Notification of the public workshops was accomplished with newspaper coverage and posting of meeting flyers in various public locations throughout Lowndes County. Following the public workshops, citizen comments were used to finalize the plan and it was delivered to the Lowndes County Commission, and to the municipal councils of the Towns of Benton, Fort Deposit, Gordonville, Hayneville, Lowndesboro, Mosses, and White Hall for review and comments. The plan was then submitted to the Alabama Emergency Management Agency for review, comments and revisions prior to adoption by the local governments in Lowndes County. Documentation of the adoption of the plan can be found in Appendix A.

As part of the planning process, a review was conducted of known historical and current plans, ordinances, and studies that were prepared for the County and its municipalities. These plans were researched for ideas and relevance in terms of disaster mitigation and preparedness, and a short list of findings were presented, which concluded that there was especially little data or information directly related toward hazard mitigation found in the reviewed documents. The information found in these plans was used to help identify hazards and risks, determine vulnerabilities, and provide

ideas for mitigation strategies and activities. A description of this review and the results can be found the Hazard Identification chapter.

The public involvement process allowed a specialized committee (the Lowndes County LEPC) with specific ties in terms of both benefits and responsibilities to work directly on the preparation of the mitigation plan, providing suggestions from both an individualized or agency perspective and for the overall welfare of the citizens of Lowndes County. Following the committee meetings with public workshops and review by the local governments insured that the citizens were aware of the process, had ample opportunity to comment, and that the plan was not biased in the direction of any one agency or segment of the population.

Following the ten-step process, an inventory was made of Lowndes County to determine the physical characteristics of the area, development and land use patterns, and demographics. The inventory was followed by identification of natural hazards and their potential impact on Lowndes County, coupled with an investigation of previous disaster events. With this information at hand, the LEPC was able to determine those hazards that are most likely to impact Lowndes County and cause the most severe damage. The LEPC identified seven natural hazards that became Priority 1 hazards, meaning they were most likely to occur more often and/or have the most severe impact on Lowndes County and its citizens. From this point, it was possible to identify those facilities that are critical in terms of disaster recovery or disaster impact and outline measures to be taken to protect them, or at least minimize damage, in the event of a natural hazard occurrence. These measures became the mitigation strategy portion of the Lowndes County Natural Hazard Mitigation Plan. The final parts of the plan include an implementation schedule and a plan to review and maintain the Lowndes County Natural Hazard Mitigation Plan on a regular basis.

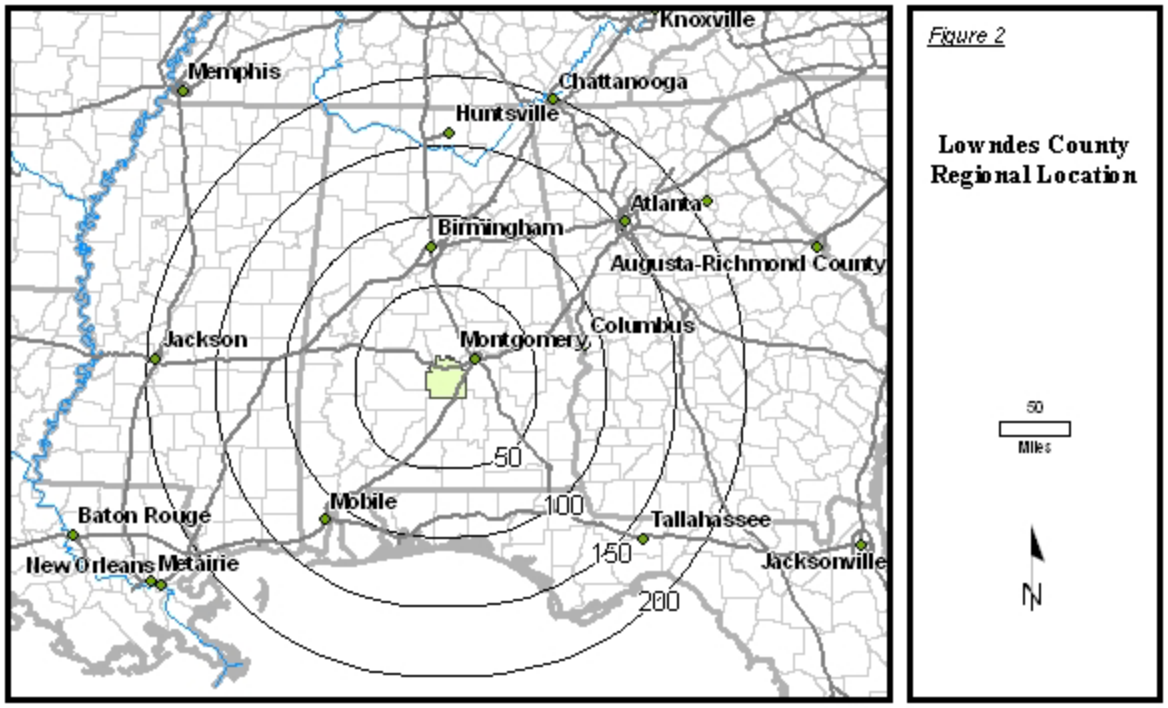
As mentioned previously, each adopting jurisdiction (i.e., the County Commission and the seven municipalities) was invited to participate and send representatives to the Lowndes County LEPC. Representatives from each of the jurisdictions did participate by: attending the LEPC and/or public meetings; reviewing drafts of the Lowndes County Natural Hazard Mitigation Plan; submitting suggestions and information for inclusion in the Plan; and/or by formal adoption (via resolution) of the Lowndes County Natural Hazard Mitigation Plan.

Implementation of the Lowndes County Natural Hazard Mitigation Plan will be shared by all participating local governments in the county, along with a number of emergency agencies and responders. The on-going review and evaluation will allow the Lowndes County Emergency Management Agency to revise and update the mitigation plan in response to changing conditions and changes in the economic climate that may have an impact on the provision of facilities and services.

II. COMMUNITY PROFILE

Lowndes County, located in south central Alabama, is a primarily rural county with seven incorporated municipalities: Benton, Fort Deposit, Gordonville, Hayneville, Lowndesboro, Mosses, and White Hall. Hayneville, located in the central eastern part of the county, is the county seat. Lowndes County is located within 50 miles of Montgomery, Troy, and Selma. Major Alabama cities within a 200-mile radius include Birmingham, Dothan, Huntsville, Mobile, and Tuscaloosa. Other cities within a 200-mile radius include Atlanta, Columbus, and Macon, Georgia; Meridian and Biloxi, Mississippi; and Fort Walton, Panama City, Pensacola, and Tallahassee, Florida. Lowndes County encompasses 718 square miles of land and is accessed by Interstate 65, which transects the county from its northeast corner to its southwest corner. Lowndes County also has regional access by U.S. Highways 31and 80, and Alabama Highways 21, 97, 185, and 263. A CSX rail line also bisects the county, running virtually parallel with Interstate 65 and U.S. Highway 31. Another CSX rail line runs from Montgomery west to Selma.

Lowndes County is sparsely populated with a population density of 18.8 persons per



square mile, as compared to the State of Alabama with 87.6 persons per square mile. Less than two-thirds of the county's population lives in unincorporated areas.

Figure 3

Lowndes County Population, 2000

Area	Population	% of Total Population
Lowndes County	13,473	100.0%
Benton	47	0.3%
Fort Deposit	1,270	9.4%
Gordonville	318	2.4%
Hayneville	1,177	8.7%
Lowndesboro	140	1.0%
Mosses	1,101	8.2%
White Hall	1,014	7.5%
Unincorporated Area	8,406	62.4%

Source: U.S. Census Bureau, Census 2000

Lowndes County has a population of 13,473 persons, according to the 2000 Census, of which 62.4 percent live in the unincorporated areas of the county. Of the remaining 37 percent, 9.4 percent live in the Town of Fort Deposit; 8.7 percent live in the Town of Hayneville; and, 8.2 percent live in the Town of Mosses. The majority of the population of Lowndes County is female, at 53.2 percent, and 46.8 percent are male. The female ratio of Lowndes County is slightly higher than that of the State, which is 51.7 percent.

The median age in Lowndes County is 33.9, which is younger than the median age of the State, at 35.8. The median age of Mosses is 26.8, while the median age in the other municipalities is considerably older, at 41.5 in Lowndesboro, 41.1 in Benton, 35 in Gordonville, 34.7 in Fort Deposit, 31.2 in White Hall, and 30 in Hayneville. The majority of the county population, at 33.4 percent, is under 20 years of age, while the elderly population, age 65 and older, comprises only 12.2 percent. The remaining 54.4 percent of the population is between the ages of 20 to 44 (at 32.9 percent) or between the ages of 45 to 64 (at 21.4 percent).

According to the 2000 Census, 73.4 percent of the total county population is black/African-American; 25.9 percent is white. The racial composition of other races in Lowndes County is nearly negligible, with all other races combined only comprising 0.7 percent of the total population.

Figure 4 **2000 Population by Age**

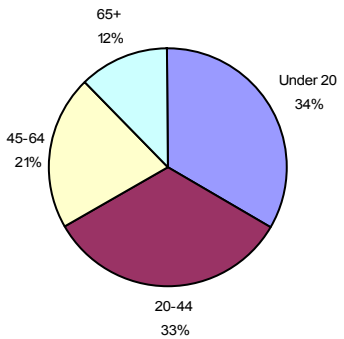
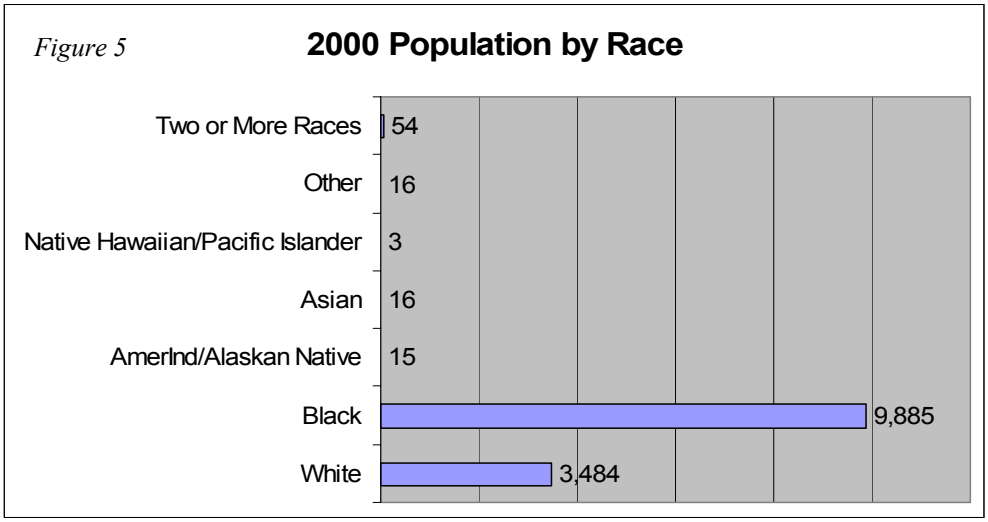


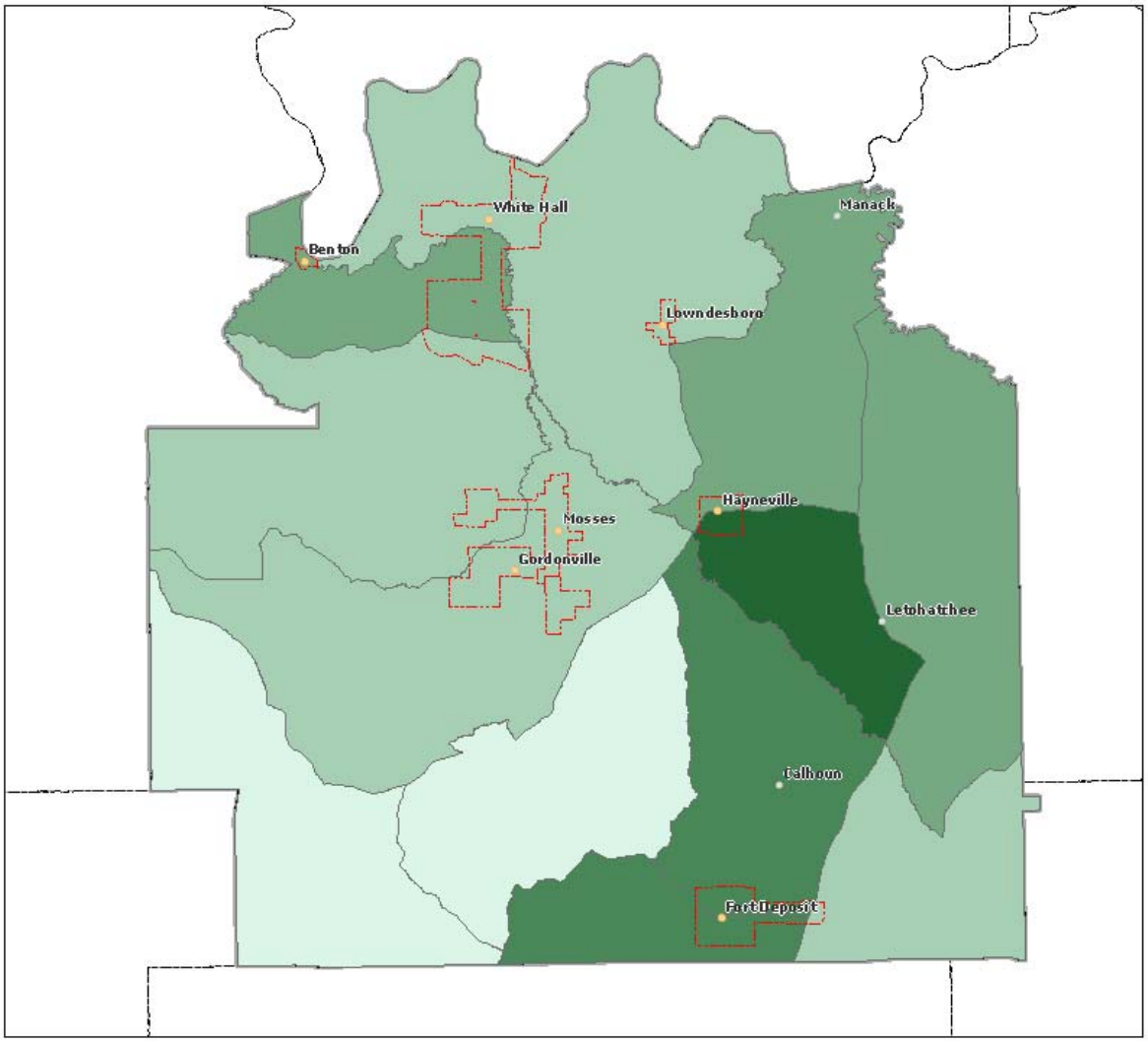
Figure 5



There are 5,801 housing units in Lowndes County, the majority of which, at 9.3 percent, are located in the Town of Fort Deposit. As shown in Figure 6, the east-central and southern central parts of the county, which include much of Hayneville and Fort Deposit, are by far the most densely populated portions of the county with the remainder of the county having three to twelve housing units or less per square mile. Of the total housing units in the county, 84.6 percent are occupied and 15.4 percent are vacant, of which 3.1 percent are for seasonal, recreational or occasional use. Of the total occupied housing, 83.3 are owner-occupied and 16.7 percent are renter-occupied. The majority of the housing units in Lowndes County, at 56.8 percent, are single unit unattached structures. Only 0.8 percent of the housing structures have four or more units. The portion of the housing structures that are mobile homes is 36.1 percent. A large portion of the county's housing stock, at 54.6 percent, is between 10 and 35 years old having been built between 1970 and 1994. Between 1995 and March 2000, 918 new housing units were constructed, comprising 15.8 percent of the existing housing stock.

Figure 6

Housing Units Per Square Mile

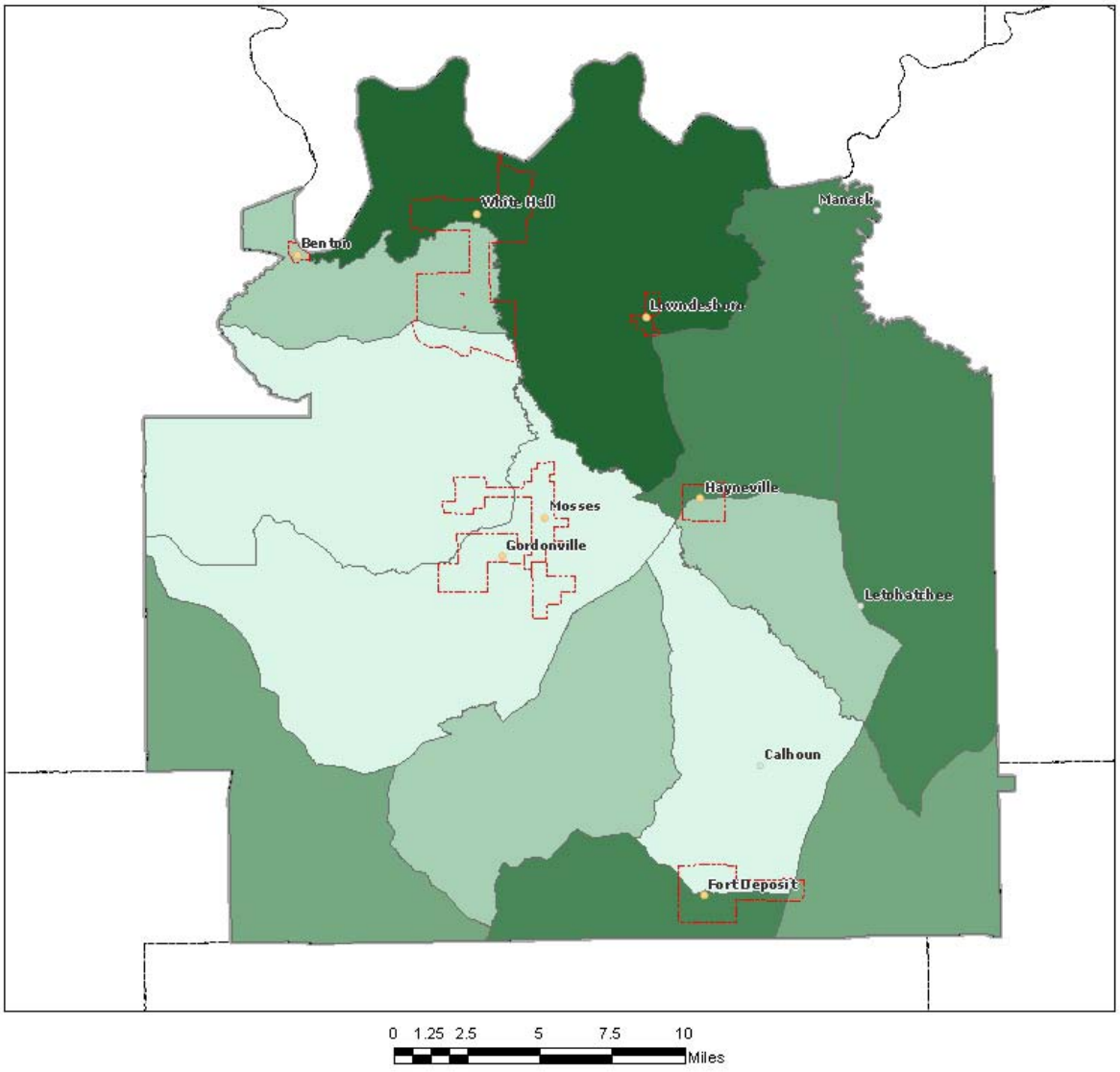


Note: This map is based on Census 2000 Block Groups.

Sources: U.S. Census 2000, SF1; Census Bureau TIGER/Line Files 2000; local sources.

Figure 7

Median Household Income



Prepared November 2005

Note: This map is based on Census 2000 Block Groups.

Sources: U.S. Census 2000, SF3; Census Bureau TIGER/Line Files 2000; local sources.

Lowndes County, overall, has a per capita income (PCI) of $12,457 and a median household income (MHI) of $23,050, according to the 2000 Census. This is considerably less than that of the State, which has a 2000 per capital income of $18,189 and a 2000 median household income of $34,135. Comparatively, the Town of Benton has a per capita income of $28,035 and a median household income of $90,000; the Town of Lowndesboro has a PCI of $17,100 and a MHI of $27,917; the Town of Fort Deposit has a PCI of $12,584 and a MHI of $20,433; the Town of White Hall has a PCI of $10,062 and a MHI of $17,031; the Town of Hayneville has a PCI of $9,555 and a MHI of $19,554; the Town of Gordonville has a PCI of $8,948 and a MHI of $10,278; and the Town of Mosses has a PCI of $8,268 and a MHI of $17,031. The portions of the county with the lowest median household income, as shown in Figure 7, are in the west and southwest, generally in the vicinities of the Towns of Gordonville and Mosses and the community of Calhoun.

It makes sense that the population base is located along the major transportation axes of the county when viewed from a geographical standpoint. As shown in Figure 8, much the regional access is located in the northern and eastern parts of the county, while the western and southern extremes are comprised primarily of county roads. General land use patterns (Figure 9) also follow the transportation system, with the majority of structural development being located along the Interstate 65 / U.S. Highway 31 and U.S. Highway 80 corridors.

Figure 8

Regional Access

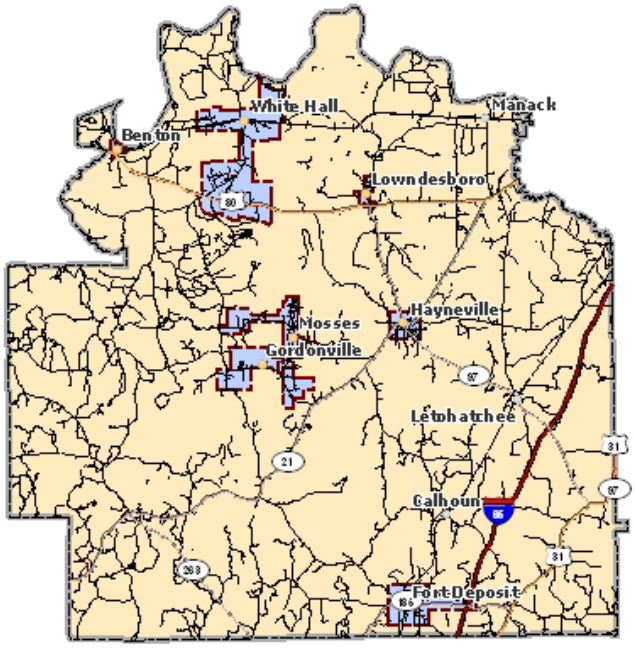
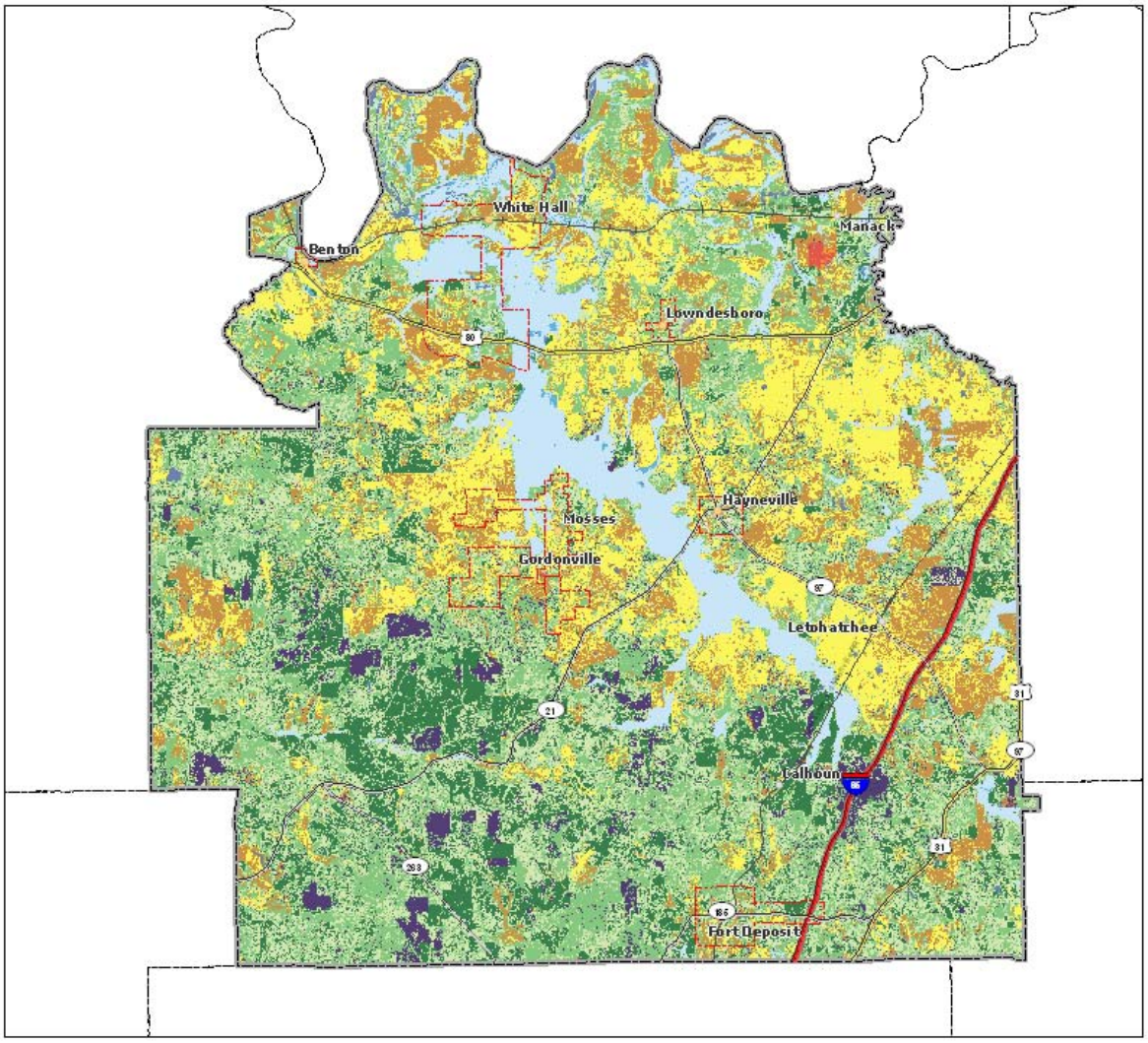


Figure 9

Land Use & Land Cover



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Sources: USGS, Alabama Land Cover Data Set, 1999; Census Bureau TIGER/Line Files 2000; and local sources.

Residential land uses throughout Lowndes County tend to be low density single family housing, with a small percentage of medium and high density housing mainly found in the Hayneville and Fort Deposit areas. As stated earlier, 36.1 percent of the housing in the county is mobile homes, most of which (at 74.5 percent) are found in the unincorporated areas. The land use / land cover map does not show any major concentrations of high intensity residential uses outside of the Towns of Hayneville and Fort Deposit.

Agricultural uses in Lowndes County are primarily livestock, poultry, forage, cotton, sod, and timberland. Of the total 459,520 acres (718 sq. miles) in Lowndes County, approximately 66.7 percent is in forest/timberland. Forested land is located throughout the county, but primarily in the southeastern half. The most concentrated areas in crop and pasture land uses are found in the northeastern half of the county.

The physical conditions of Lowndes County were also assessed, including topography, hydrology/hydrography, soils, and mineral resources. The physical descriptions contained hereafter are as found in the Lowndes County Capital Improvements Strategic Plan, 2002.

Lowndes County contains three physiographic sub-regions: Terrace and Flood Plain, Black Prairie, and the Chunnennuggee Hills. Based on these sub-regions, the topography of the county is divided into two general sections: one encompassing the Terrace and Flood Plain elevations and the other encompassing both the Black Belt and Chunnennuggee Hills with elevations of 250 feet and 500 feet. These last two sub-regions form a wide "U" shaped band covering much of the western, southern, and eastern portions of the County. The terrace and flood plain cover the remaining portions of the County.

Most of Lowndes County is level to gently rolling. However, the Chunnennuggee Hills in the southern part of the County create more broken terrain. Especially steep slopes are found in the southwestern corner of the County near the County line. In the vicinity of Fort Deposit, rough topography is found along Fort Deposit Creek immediately north of the developed are and along Ballard's Creek east of Town. Rougher topography and steep slopes are found in the vicinity of the Collirene and Petronia communities in the western end of the County. Excessive slopes are also present along sections of the County's major streams where the alluvial terraces have been deeply eroded. Rough terrain is not a significant factor in the Hayneville, Lowndesboro, and Benton vicinities.

There are broad flood plains adjoining the Alabama River and Big Swamp Creek. Smaller flood plains are present along Pintlala Creek, Tallawassee Creek, Steep Creek, Pinchony Creek, Cedar Creek, and their tributaries. Only limited flooding occurs along the streams in the vicinity of Fort Deposit. The flood plains of Big Swamp Creek lies in the southwest of the corporate limits of Hayneville, and there is minor flooding along

tributaries of Big Swamp Creek in the vicinity of Hayneville, there is no significant problem with flooding in the Lowndesboro planning area, but the Town of Benton can be severely affected by periodic flooding of the Alabama River.

Ground water is that water below the land surface that occurs in a zone where the enclosing material is fully saturated. It is ground water that can be pumped from wells or that flows from springs and is obtained primarily from precipitation. In Lowndes County, there is an abundant quantity of ground water, but unfortunately the ground water found in broad sections of the County is of poor quality. This aspect is particularly relevant to future residential development in the County.

The mineral content of ground water may limit its usefulness. Most domestic users are concerned with dissolved solids content, hardness, chloride, and dissolved iron concentrations in the water. Water quality requirements for industry vary depending on the use. Some industries such as food processing and canning frequently require lower levels of minerals than municipal supply requirements. Conversely, when the water is used for cooling purposes, higher levels of dissolved minerals can be tolerated. The water quality of streams in Lowndes County generally is good, and the water is suitable for most uses. Results of chemical analyses indicate that contents of total dissolved solids rage from 36 to 250 mg/L, and hardness ranges from 65 to 85 mg/L of $CaCO_3$, which is considered moderately hard to hard. The dissolved iron content is high, ranging from 200 to 930 micrograms per liter, but that is not considered a hazard to health. The overall chloride content is low, ranging from 0.2 to 15 mg/L.

Soils must also be evaluated with respect to limitations presented for various types of uses. A detailed examination of soil characteristics can aid in determining the most compatible arrangement of industrial, commercial, residential, and recreational uses. Evaluation of soil types within the County assist in identifying area with high water tables, area with bedrock near the surface and in delineating areas that are subject to periodic flooding.

A majority of the soils in Lowndes County have moderate to severe limitations for all types of urban development. Typical of soils in Alabama's Black Belt Region, Lowndes County soils are characterized by the scarcity of land suitable for efficient development. Soil characteristics which are important for development in the County would include the ability of the soils to permit efficient use of land and economical construction techniques for residential, commercial, and industrial structures.

The north-central portion of the County is typified mainly by the Bama-Goldsboro-Lucedale soils group. Where the slope is less than 12 percent, these soils have slight to moderate restrictions to septic tank field absorption and dwelling foundations. The Leaf-McQueen-Wickham group is primarily located in the Alabama River floodplain. Because of the high water table and frequent flooding, these soils have severe

restrictions for all urban land uses. Similarly, the Leeper Association, located primarily in the Big Swamp Creek region, is severely restrictive to all urban uses.

Scattered throughout the middle region of the County are the Sumter-Oktibbeha and Oktibbeha-Luverne groups. These upland soils also have restrictions for urban uses. Located in the southern portion of the County is the Luverne-Lucy soils association. These soils present general moderate to severe limitations for most types of urban development.

In contrast to the problems posed for urban development, the Bama-Goldsboro-Lucedale and Leeper associations are desirable locations for forestry and agricultural uses. Both are particularly well suited for pasture and (along with the Leaf-McQueen-Wickham association) woodland. The Bama-Goldsboro-Lucedale and Leeper associations are also the most suitable areas in the County for croplands.

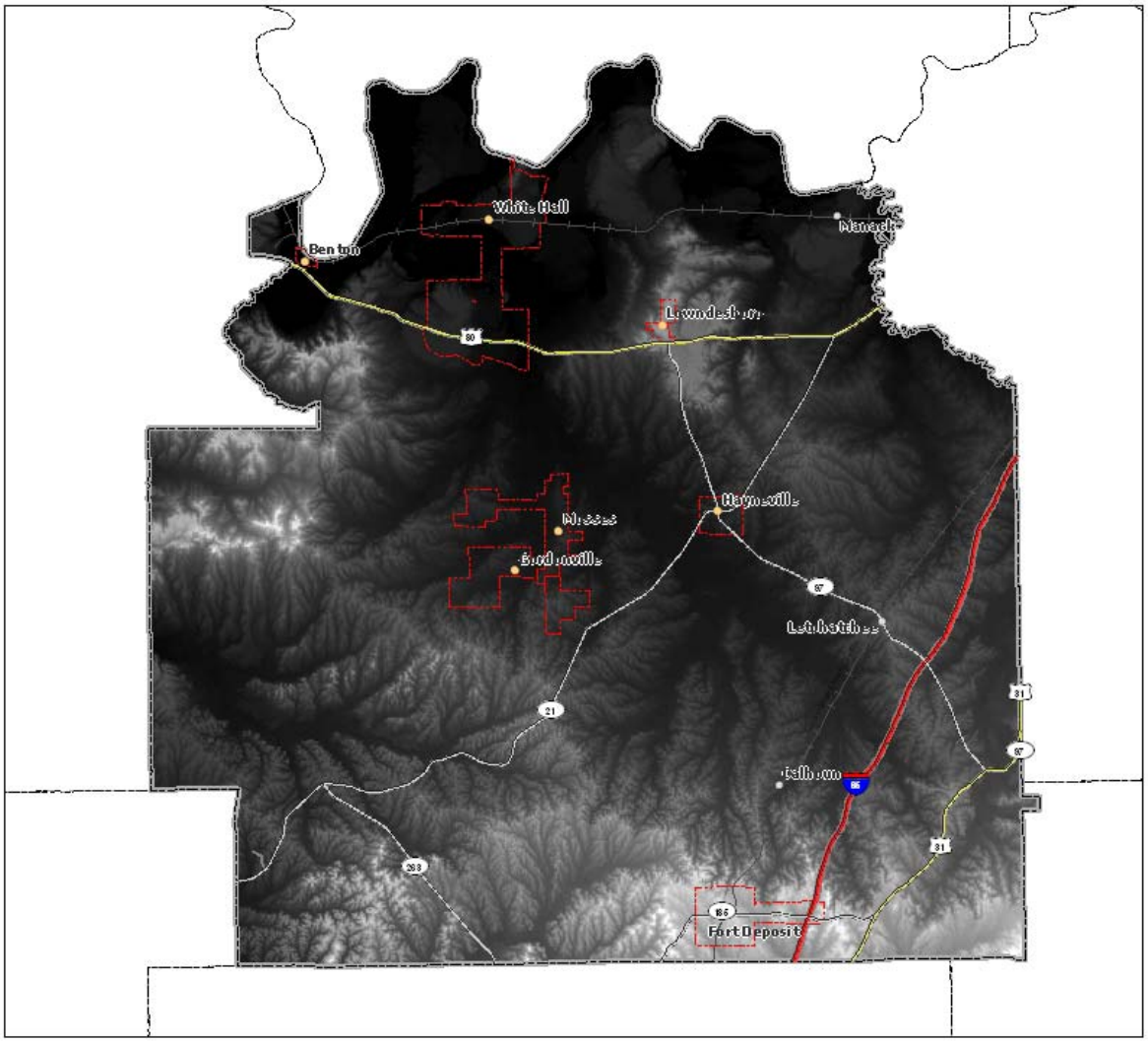
With the exception of the quaternary and recent geological ages, all geologic formations in the County were formed during the cretaceous and tertiary ages. These formations are sedimentary in origin and generally slope downward to the south-southeast at a rate of 30 to 50 feet per mile. They are composed chiefly if clay, chalk, limestone, mud, sand, and gravel. The formations are: 1.) Clayton Formation, 2.) Providence Sand Formation, 3.) Prairie Bluff Chalk, 4.) Ripley Formation, 5.) Demopolis Formation, 6.) Mooreville Chalk, 7.) Gordo Formation, and the 8.) Coker Formation. These last two formations comprise the Tuscaloosa Group. Below these formations beginning at approximately 950 feet in depth are crystalline rocks.

Lowndes County is not endowed with extensive commercially exploitable mineral deposits. The only known deposits with commercial potential are clay, limestone, sand, and gravel. The commercially valuable clay deposits in Lowndes County occur near the base of the Ripley formation in southeastern Lowndes County. This clay is composed of up to 95 percent calcium montmorillonite and is used as a binder for foundry molding sand. Although the clays in Lowndes County are too sandy for ceramic use, some deposits of the residual soils can be used to make attractive dark-red brick and tile.

Limestone deposits are present in the western part of Lowndes County. These potentially profitable economic deposits, which generally result from the accumulation of calcium carbonate in a marine environment and the eventual crystallization and hardening into limestone, occur in the upper part of the Clayton Formation in Lowndes County. Sand and gravel deposits are found in the extreme northern part of the County in the vicinity of the Alabama River and throughout the southern half of the County.

Figure 10

Digital Elevation Model



0 1.25 2.5 5 7.5 10
Miles

N

Prepared November 2005

Legend

CFCC Road Class
- Limited Access
- Primary
- Secondary
- Lowndes Co. Railroads
- Lowndes Co. Municipalities
- Lowndes Co. Boundary

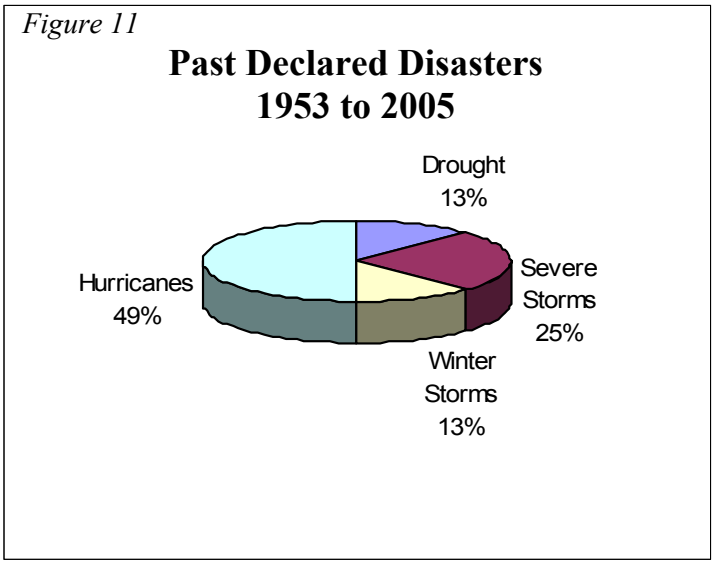
Sources: NASA, NIMA, German Aerospace Center, & Italian Space Agency, SRTM Elevation Dataset, 2002; Census Bureau TIGER/Line Files 2000; and local sources.

Note: Darker areas represent lower elevations.

III. HAZARD IDENTIFICATION

Natural hazards that have the potential to impact Lowndes County were identified using a variety of resources. First, an overall list of natural hazards was obtained from Federal Emergency Management Agency Publication 386-2 which is a state and local mitigation planning how-to guide entitled: *Understanding Your Risks – Identifying Hazards and Estimating Losses*. Using the general list of natural hazards, research was conducted into past disaster occurrences in Lowndes County and the physical characteristics of the county that lend themselves to natural hazard occurrences, along with a review of historical and existing plans and regulations in Lowndes County that identify the potential for natural hazards.

Figure 11



In an initial review of the list of natural hazards, five of the 19 listed hazards were eliminated due to a lack of applicability in Lowndes County. The five hazards that were discounted were avalanche, coastal erosion, earthquake, tsunami, and volcano. The list of the remaining 13 hazards was then utilized to identify which hazards had a true potential to impact Lowndes County. The 13 hazards (some of which were combined) that were researched include: dam failure, drought, expansive soils / land subsidence, extreme heat and drought, flood, hurricane / tropical storm, landslide, winter/ice storm, tornado, wildfire, and severe thunderstorm / lightning / hail / high winds. A review of past disaster declarations (available through FEMA) in Lowndes County revealed that the most frequent federally declared natural disasters between 1953 and 2005 have been for hurricanes and their associated effects, at 49 percent of all federally declared disasters. Other federal disaster declarations were for severe storms, drought, and a winter storm.

Of the eight declared disaster events during the 52-year period, all were federal declarations. The dates and types of occurrences are shown in Figure 12. In each of the eight federal declarations, federal assistance was provided to Lowndes County in the following manner: both public and individual assistance was provided in five declarations; and only public assistance was provided in three declarations. Beyond financial assistance, federal assistance was provided in the form of crisis counseling, disaster housing, disaster unemployment assistance, and individual, and family grants.

Figure 12

Past Declared Disasters, 1953 to 2005

Date	Hazard	Declaration
March 1975	Severe Storm/Flooding	Federal Declaration
July 1977	Drought	Federal Declaration
March 1990	Severe Storm	Federal Declaration
March 1993	Winter Storm	Federal Declaration
October 1995	Hurricane Opal	Federal Declaration
September 1998	Hurricane Georges	Federal Declaration
September 2004	Hurricane Ivan	Federal Declaration
July 2005	Hurricane Dennis	Federal Declaration

Source: Federal Emergency Management Agency, April 2006

Information available through the National Climatic Data Center (NCDC) – an agency of the National Oceanographic and Atmospheric Administration (NOAA) – show that Lowndes County suffered a total of 129 weather events between January 1950 through December 2005, which is an average of almost 2.35 events per year. Per data from the National Weather Service (NWS) – another NOAA agency – an additional seven tornado events occurred between 1897 and 1956. The most frequent weather event during the 1950-2005 period were severe thunderstorms / hail / windstorms, with 97 occurrences resulting in a total of $364,000 in property damage. Thunderstorms and windstorms were followed by tornados, with 19 events resulting in over $1.3 million in property damage, two fatalities, and 14 injuries. Of the remaining weather events profiled by the NCDC during the same period, Lowndes County suffered seven flood events, two winter storms, one heat and four extreme cold events, and six tropical cyclones. Although they occur less frequently, the NCDC information shows that hurricanes and tropical storms were, by far, the most costly to the county, resulting in an estimated $138.8 million and $10.2 million in property and crop damages, respectively, and the loss of two lives and eight injuries.

Flooding in Lowndes County is most likely to occur in the floodplain areas found along the Alabama River and several major streams and their tributaries. Lowndes County does not have a history of the severe flooding that is found in low elevation areas such

as Elba, Alabama. But, local residents report occasional minor flooding and road washing and erosion as a result of heavy rains and localized flash floods. Per NCDC data, seven flood events occurred in the county from 1998 through 2005 that resulted in $142,000 in property damage. Floodplains in Lowndes County are shown in Figure 13. With the exceptions of the Alabama River and Big Swamp Creek, most of the floodplain areas tend to be narrow and linear in nature, following stream beds and to some degree larger tributaries of the Beaver, Big Swamp, Dry Cedar, Mush, Pinchony, Pintlala, Steep, and Tallawassee Creeks. The floodplains are generally not expansive, with the widest areas being approximately two miles in width (mainly along the Alabama River and Big Swamp Creek areas).

Information available from the Geological Survey of Alabama (GSA) shows that Lowndes County has never been impacted by an earthquake in their reporting period from 1886 through 2005. GSA information also reveals that Lowndes County has a low incidence probability of landslides occurring in the county, as shown in Figure 15. Additionally, there are outcrops of carbonate, limestone, and other rocks in the extreme southern edge of Lowndes County that exhibit karst and/or pseudokarst terrain characteristics. These areas are susceptible to sinkholes, however the county does not have currently have active sinkholes and land subsidence.

Eight tropical cyclones have traversed Lowndes County during the 153-year period from 1851 through 2004. As shown in Figure 15, 4.5 of the six tracks of the tropical cyclones were minor tropical storms or depressions. However, two H1 hurricanes have occurred in the county in the referenced time period.

A review of historical and existing plans and regulations for Lowndes County and its municipalities revealed that there is very little current information that is directly related to hazard identification or natural hazard mitigation. Existing information does include limited police and fire protection services and needs; and statements as to the need for road and bridge improvements, and limitations to development in flood-prone areas. The review of past and existing plans shows that the potential for disaster events must have received some consideration in past growth and development planning for the county, which is evident in the relative lack of development that has occurred in the flood-prone areas of the county. This review also resulted in a short list of available tools that can be utilized to facilitate or complement current and future hazard mitigation activities. These tools include: participation in the National Flood Insurance Program (NFIP), flood damage prevention ordinances, storm water management guidelines, subdivision regulations, zoning ordinances, capital improvement programs, and proposed dangerous buildings ordinances.

Historical plans and studies that were reviewed include: Areawide Plan: Fire Protection Study, 1974; Areawide Study: Environmental Assets, 1975; Areawide Plan: Rural Land

Use Analysis, 1977; Areawide Study: Environmental Review Manual, 1977; Areawide Land Development Plan, 1978; Areawide Rural County Highway Development Plan, 1992; Mid-South Resource Conservation & Development Area Plan, 1994; South Central Alabama Development Commission (SCADC) Regional Solid Waste Needs Assessment, 2003; Lowndes County Historic Assets, 1975; Lowndes County Industrial Sites & Community Environment, 1975; Lowndes County Land Use & Transportation Plan, 1976; Lowndes County Housing Plan, 1977; Lowndes County Community Development Target Area Study, 1980; Lowndes County Solid Waste Management Plan, 1990; Alabama Economic Enhancement Strategy for Lowndes County, 1991; Lowndes County Housing Plan, 1993; and the Lowndes County Water & Sewer Planning Report, 2002. Current plans that were reviewed include: Alabama's Bridges: A Report on Conditions, Current Use and Funding Needs, 2000; Alabama Rail Plan, 2001; Statewide Strategic Plan, Phases I & II, 2001 & 2002; Envision 2020: The River Region Sharing One Future, 2001; Lowndes County Capital Improvements Strategic Plan, 2002; SCADC/District Comprehensive Economic Development Strategy, 2005; Lowndes County Emergency Operations Plan; Lowndes County Industry & Community Data; Hayneville Development Guide, 2004; and the current comprehensive plans, zoning ordinances, and subdivision regulations of the various municipalities.

With this information, the Lowndes County Local Emergency Planning Committee (LEPC) was able to identify and prioritize those hazards that have the most potential to impact Lowndes County and its municipalities. As a result of the committee discussions about the previous information and the data found in the next chapter, seven natural hazards were identified as Priority 1 hazards, meaning that they were the most likely to have the greatest and/or most frequent impact on Lowndes County and each of its municipalities. These seven Priority 1 natural hazards, in order of priority are: flooding, tornados, hurricanes/tropical storms, expansive soils/sinkholes, wildfires, severe thunderstorms/windstorms/hail, and drought. Natural hazards that were determined not to be applicable to Lowndes County and its municipalities include: earthquakes, volcanoes, tsunamis, avalanches, and coastal erosion. Priority 2 hazards include dam failures and extreme heat; and, Priority 3 hazards include: coastal storms, landslides, and winter/ice storms. The hazard identification and prioritization are shown in Figure 16.

The LEPC also identified a few additional hazards as having potential impact upon the county and its citizens. These include chemical spills, vehicular accidents on U.S. Highway 80, railway accidents, and avian influenza. Since most of these are technical or "man-made" and/or are addressed in other plans such as the Lowndes County Emergency Operations Plan (EOP) and the Alabama Pandemic Influenza Plan, they were not included in this plan.

Figure 13

Floodplains

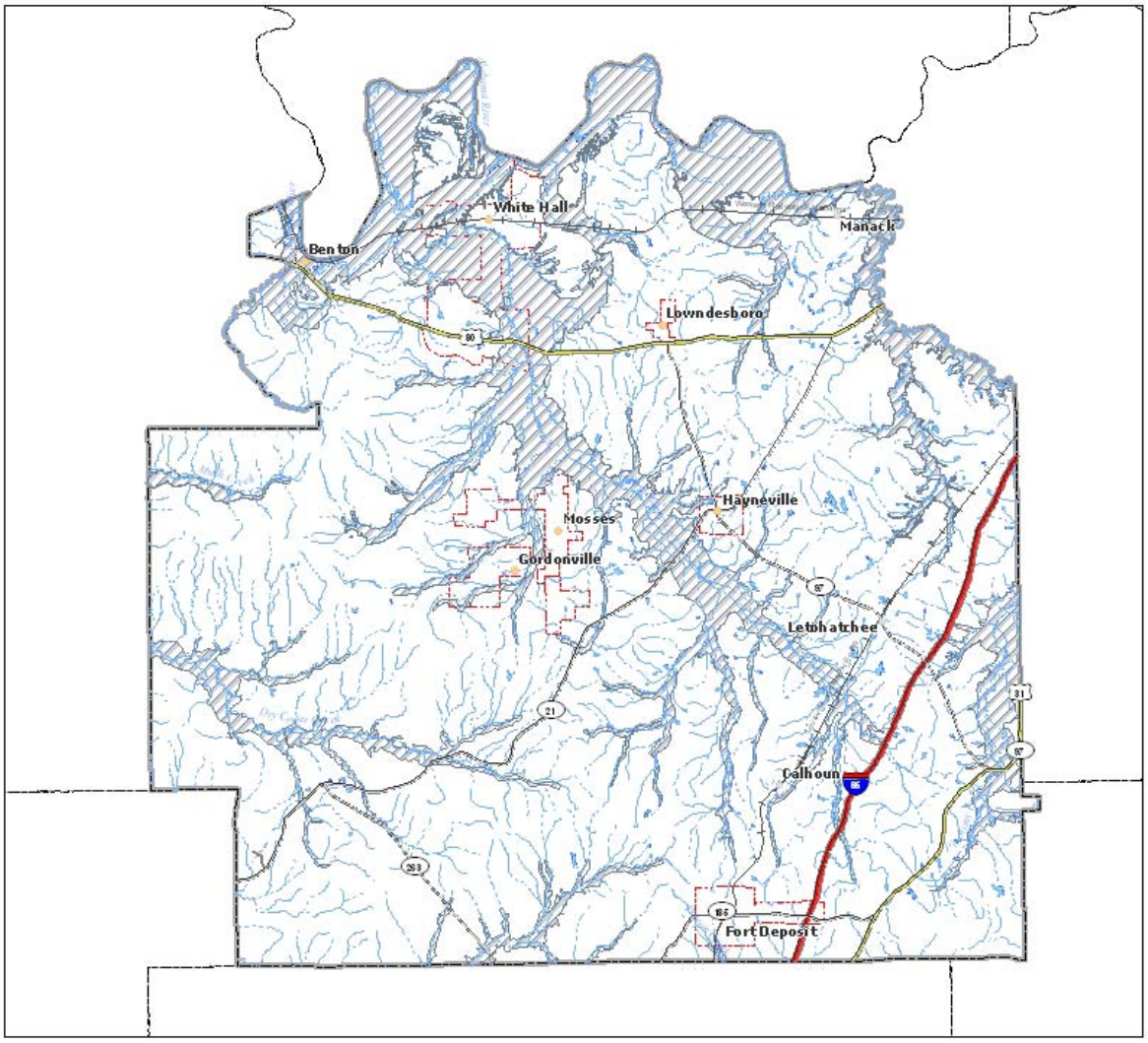
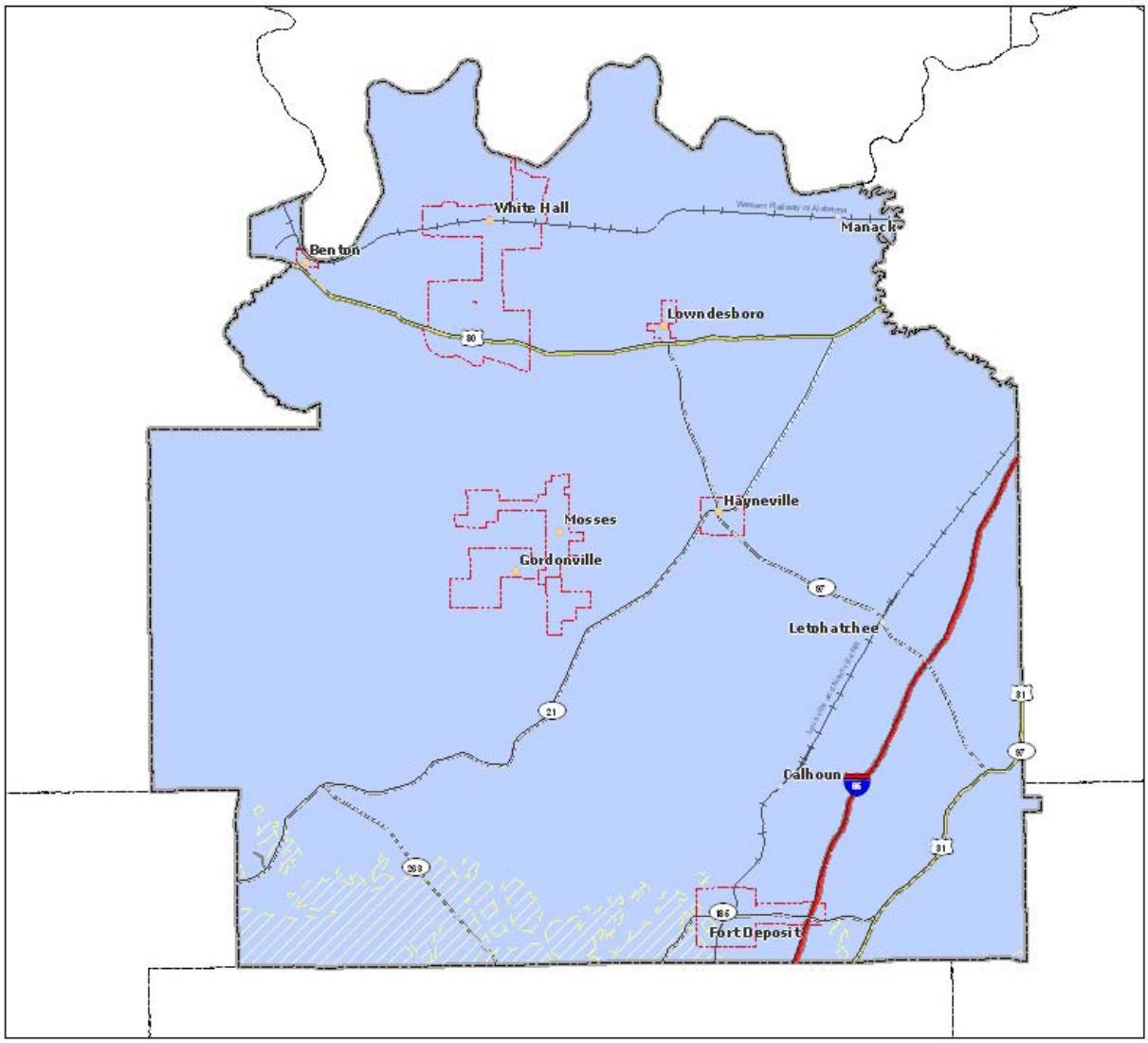


Figure 14

Landslide & Sinkhole Potential



0 1.25 2.5 5 7.5 10
Miles

N

Prepared March 2006

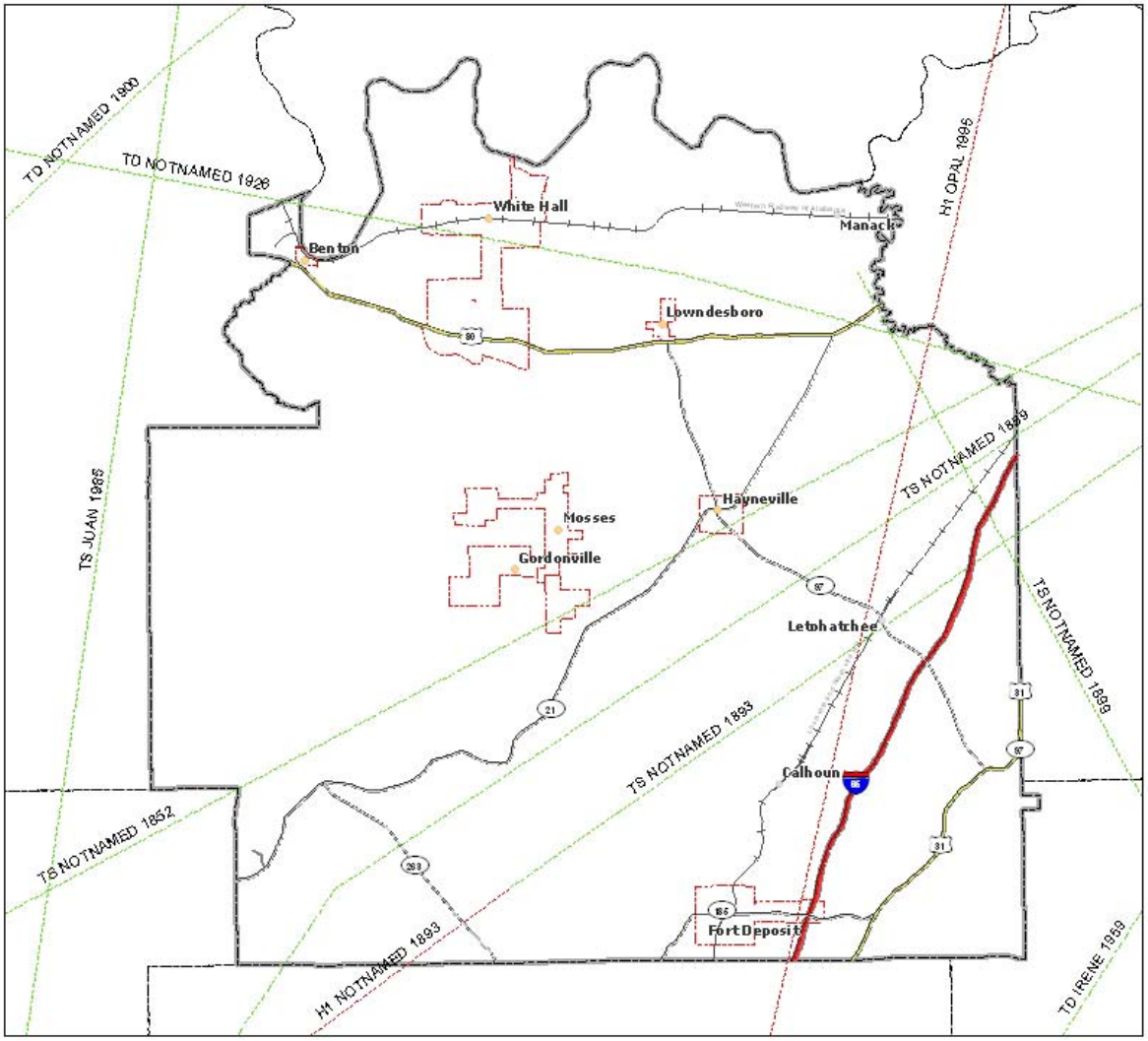
Legend

Landslide Potential	CFCC Road Class
Incidence-Low	Limited Access
Incidence-Moderate	Primary
Incidence-High	Secondary
Susceptibility-Moderate	Lowndes Co. Railroads
Susceptibility-High	Lowndes Co. Municipalities
Combination High	Lowndes Co. Boundary
Sinkhole Potential	

Sources: USGS, Landslide Incidence & Susceptibility in the Conterminous US, 2001; GSA, Limestone & Carbonate Rock Outcroppings, 2006; Census Bureau TIGER/Line Files 2000; and local sources.

Figure 15

Tropical Cyclones



N

Prepared November 2005

Legend

Historical Tracks (1851-2004)
Categories
- Extratropical Storm (E)
- Subtropical Depression (SD)
- Subtropical Storm (SS)
- Tropical Disturbance (D)
- Tropical Wave (W)
- Tropical Low (L)
- Tropical Depression (TD)
- Tropical Storm (TS)
- Hurricane (H1)
- Hurricane (H2)
- Hurricane (H3)
- Hurricane (H4)
- Hurricane (H5)

CFCC Road Class
- Limited Access
- Primary
- Secondary
- Lowndes Co. Railroads
- Lowndes Co. Municipalities
- Lowndes Co. Boundary

Sources: NOAA, Tropical Prediction Center/National Hurricane Center, Historical North Atlantic Cyclone Tracks 2004; Census Bureau TIGER/Line Files 2000; and local sources.

Tornados were determined to be a Priority 1 hazard due to the history of past occurrences, the speed of the events, the severity of damages incurred, and the high potential for loss of life. Since 1897, tornados have caused over $1.3 million in property damage alone. The agricultural character of Lowndes County makes wildfire a significant hazard for residents of the county. The potential impact of wildfire is increasing as residents continue to build residential structures outside the various corporate limits, expanding the urban interface areas. According to the Alabama Forestry Commission, Lowndes County experienced 317 fire events between 1995 and 2003, which combined accounted for over 1,600 acres of land burned.

Climatic conditions of Lowndes County make drought a Priority 1 hazard. Again, the agricultural community is particularly at risk in terms of property and crop damage from extreme heat and related drought conditions. Also, the high percentage of the population with low income or living in poverty and those living in unincorporated areas without access to public water are particularly at risk due to dry wells and lack of financial resources for air conditioning to ward off the impact of drought-related heat conditions. Although Lowndes County does not suffer from extreme property damage or loss of life due to flooding, the potential of flooding events makes it a Priority 1 hazard. The impact of flooding in Lowndes County is due more to interruption of services due to impassable roads and continued road and bridge improvements. Like flooding, it is the frequency of severe storms that make them a Priority 1 hazard. Of the past storm events, between 1950 and 2004, thunderstorms, windstorms, and hail storms were the most frequent hazard event with 97 occurrences during that time period.

Expansive soils/sinkholes were identified as a Priority 1 hazard because of the existence of carbonate and limestone rock outcroppings in the southern edges of the county. Since these outcroppings are in proximity to floodplains, the potential exists for future events of this nature.

No other natural hazards were identified that were not included on the list of hazards outlined by the Federal Emergency Management Agency Publication 386-2, which is a state and local mitigation planning how-to guide entitled: *Understanding Your Risks – Identifying Hazards and Estimating Losses*.

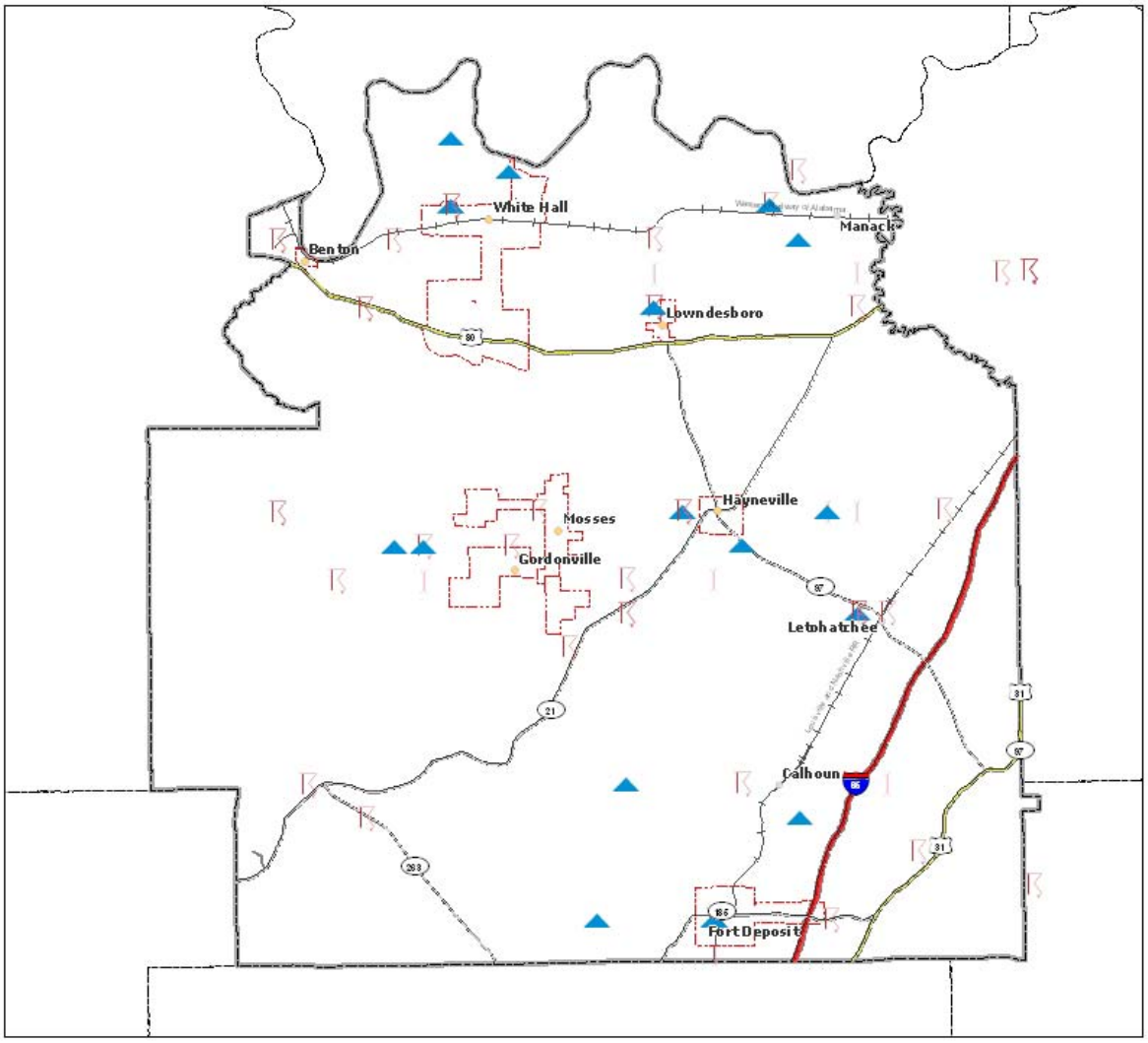
Figure 16

Natural Hazard Identification and Prioritization for Lowndes County and All Municipalities

Hazard	Priority 1	Priority 2	Priority 3	Not Applicable
Avalanche				**16**
Coastal Erosion				**17**
Coastal Storm			**10**	
Dam Failure		**8**		
Drought	**7**			
Earthquake				**13**
Expansive Soils/Sinkhole	**4**			
Extreme Heat		**9**		
Flood	**1**			
Hurricane/Tropical Storm	**3**			
Landslide			**11**	
Severe Thunderstorm/Wind/Hail/Lightning	**6**			
Tornado	**2**			
Tsunami				**15**
Volcano				**14**
Wildfire	**5**			
Winter/Ice Storm			**12**	

Figure 17

Historical Storm Events*



0 1.25 2.5 5 7.5 10
Miles

Legend

TYPE	CFCC Road Class
Severe Thunderstorm	Limited Access
Hail	Primary
Tornado	Secondary
High Wind	Lowndes Co. Railroads
Tstm Wind	Lowndes Co. Municipalities
	Lowndes Co. Boundary

N

Prepared November 2005

*Note: The Storm Events depicted here are based on the geographic coordinates provided by NOAA's National Climatic Data Center (NCDC). Since the NCDC only included figures for degrees and minutes, and not seconds, the event locations depicted are approximate. Additionally, only severe thunderstorms/ winds, hail storms, and tornados are shown since they are the only storm events with geographic coordinates provided. It can be assumed that other storm events not depicted herein (e.g., hurricanes, winter storms, etc.) occurred countywide or that the coordinates data was not available or recorded.

Sources: NOAA, National Climatic Data Center (NCDC), Storm Events, 1950-2004; Census Bureau TIGER/Line Files 2000; and local sources.

IV. RISK ASSESSMENT AND VULNERABILITY ANALYSIS

The risk assessment and vulnerability analysis is based on the following Priority 1 natural hazards as identified by the Lowndes County LEPC and described in the previous chapter: flooding, tornados, hurricanes/tropical storms, expansive soils/sinkholes, wildfires, and severe thunderstorms/windstorms/hail. The *State of Alabama Hazard Risk and Vulnerability Analysis,* prepared by the Alabama Emergency Management Agency defines ***risk*** as the probability that damage to life and property will occur due to impacts from a particular natural hazard. This can include an analysis of: the **magnitude**, or how big or strong the event may be, the **duration**, or how long the event will last, the **frequency**, or how often the event may occur, and the **area affected,** or where and how much area may be impacted by an event. The same document defines ***vulnerability*** as the degree of **exposure** to a hazard – how susceptible an area is to a hazard and the losses likely to result from a disaster.

In this chapter, each of the Priority 1 hazard categories will be assessed in terms of risk and vulnerability, as defined. Information provided for each category includes a definition of the hazard; the degree of risk as noted by the priority rating given to each hazard by the Lowndes County Local Emergency Planning Committee upon identification of the hazard; historical and financial loss data, if available; and the degree of impact (vulnerability) on Lowndes County and its residents, with comments regarding how the hazard might or could affect the county. The chapter concludes with the identification of critical facilities that could be impacted by any of these hazard events.

Flooding

As defined by the Federal Emergency Management Agency, a flood is a natural event for rivers and streams. Excess water from snowmelt, rainfall, or storm surge accumulates and overflows onto the banks and adjacent floodplains. Floodplains are lowlands, adjacent to rivers, lakes and oceans that are subject to recurring floods. Flooding is one of the most common hazards in the United States and kills an average of 150 people a year nationwide. While Lowndes County is not highly susceptible to severe inundation of flood waters, it is highly susceptible to the rapid occurrence of flash floods that make parts of the county inaccessible by road and interrupt the delivery of services and the ability to respond in an emergency. Flooding is number

one on the list of natural hazards that have the greatest potential to impact Lowndes County.

Profile of Flooding Events in Lowndes County & Municipalities, 1950 to 2005					
Flooding					
Date	**Location**	**Type**	**Loss of Life**	**Injuries**	**Financial Loss**
1/7/1998	Countywide	Flash Flood	0	0	$30,000
9/29/1998	Countywide	Flash Flood	0	0	$60,000
3/3/2001	Countywide	Heavy Rain	0	0	$18,000
3/12/2001	Countywide	Flash Flood	0	0	$5,000
4/7/2003	Countywide	Flash Flood	0	0	$20,000
7/10/2005	Hayneville	Flash Flood	0	0	$2,000
4/1/2005	Countywide	Riverine Flood	0	0	$22,000
Total	**7 events**		**0**	**0**	**$157,000**
JURISDICTIONAL SUMMARY					
Benton	0 events		0	0	$0
Fort Deposit	0 events		0	0	$0
Gordonville	0 events		0	0	$0
Hayneville	1 event		0	0	$2,000
Lowndesboro	0 events		0	0	$0
Mosses	0 events		0	0	$0
White Hall	0 events		0	0	$0
Unincorporated Areas	6 events		0	0	$155,000
Sources: Storm Events 1950-2005, NCDC, NOAA, 2006.					

With the available information, the Lowndes County LEPC determined that, while the flooding problem is recurring, the impact of flooding on Lowndes County is low. Potential impacts from flooding are surface and groundwater contamination, increased septic failure, increased stress and anxiety, increased road damage, threat to the rail system, increased agricultural loss for both crops and livestock, and loss of natural habitat. While there is a low threat to life safety and structural conditions, the repetitive losses and damages to transportation systems make flooding a significant hazard to Lowndes County.

Tornados

As defined by the Federal Emergency Management Agency, a tornado is a violently rotating column of air extending from a thunderstorm to the ground. The most violent of tornados are capable of tremendous destruction with wind speeds of 250 miles per hour or more. Damage paths can be in excess of one mile wide and 50 miles long. Tornados are the number two hazard risk for Lowndes County, not due to the frequency of events, but instead, due to the severity of destruction and the limited warning time for response. Lowndes County is located in Wind Zone III, which is associated with 200 miles per hour wind speeds. Tornado paths are not localized and have the potential to affect any portion of the entire county during a given event.

Profile of Tornado Events in Lowndes County, 1897 to 2005					
Tornado					
Date	**Location**	**Magnitude**	**Loss of Life**	**Injuries**	**Financial Loss**
8/2/1897	County (Letohatchee)	F2	0	0	Unknown
4/24/1908	Ft. Deposit	F2	2	22	Unknown
2/5/1909	County (Burkville)	F2	3	40	Unknown
7/6/1916	Lowndesboro	F2	0	2	Unknown
2/13/1940	County (St. Clair)	F2	0	3	Unknown
5/16/1946	County (Sandy Ridge)	F2	0	0	Unknown
12/23/1956	County	F2	0	1	Unknown
6/28/1957	County	F2	0	0	$25,000
6/28/1957	County	F1	0	8	$250,000
4/29/1963	County	F2	0	0	$250,000
4/28/1964	County	F2	0	0	$250,000
11/10/1966	County	F2	0	0	$25,000
4/18/1978	County	F0	0	0	$0
11/25/1979	County	F2	0	12	$25,000
8/27/1992	County	F1	0	2	$250,000
3/18/1996	Gordonville	F2	0	2	$125,000
9/28/1998	County (Letohatchee)	F0	0	0	$49,000
3/3/2000	Lowndesboro	F0	0	0	$0
4/30/2005	White Hall	F1	0	1	$110,000
Total	**19 events**		**5**	**93**	**$1,359,000**
JURISDICTIONAL SUMMARY					
Benton	0 events		0	0	$0
Fort Deposit	1 event		2	22	$0
Gordonville	1 event		0	2	$125,000
Hayneville	0 events		0	0	$0
Lowndesboro	2 events		0	2	$0
Mosses	0 events		0	0	$0
White Hall	1 event		0	1	$110,000
Unincorporated Areas	14 events		3	66	$1,124,000
Sources: Storm Events 1950-2005, NCDC, NOAA, 2006; and Alabama Tornado Database, National Weather Service (NWS), NOAA, 2006.					

With the available information as presented, the Lowndes County LEPC determined that Lowndes County is moderately to severely vulnerable to tornados. Potential impacts from tornados include loss of life and injury; severe property damage with frame, manufactured, and congregate housing being the most susceptible; water contamination and water shortage; blocked access and road deterioration; power

outages, disruption of commerce. Lowndes County's vulnerability can be increased due to a lack of available trained response personnel, slowed emergency response time, and an overload at existing medical facilities. Resulting secondary impacts of a tornado could include panic, anxiety, and depression; power outages; interruption in utility services (e.g., communications and water); loss of tax revenue and economic opportunities; spoilage of goods; decreased employer production; and loss of agricultural income.

Tropical Cyclones (Hurricanes & Tropical Storms)

As defined by the Federal Emergency Management Agency, a tropical cyclone is a generic term for a cyclonic, low-pressure system over tropical or subtropical waters. Hurricanes are intense tropical systems that generate winds in excess of 74 mph. These storms are generally characterized by thunderstorms and defined surface wind circulation. They can produce high winds, heavy rains, erosion, flooding, and spawn tornados. Extratropical storms generate similar effects but tend to occur in the fall or winter. Because tropical and extratropical cyclones are large, moving storm systems, they can impact not only coastal areas, but inland areas as well. Hurricanes Opal (1995), Ivan (2004), and Katrina (2005), which all affected Lowndes County, are excellent examples of tropical systems having such a large impact inland. While Lowndes County is not necessarily susceptible to the full effects of a tropical cyclone making landfall along the coast, it is highly susceptible to the other events that occur or spawn off of the cyclonic system. Floods caused by the storm's rain can make parts of the county inaccessible by road and interrupt the delivery of services and the ability to respond in an emergency. Tornados spawned off of a hurricane can cause loss of life, injuries, and cause damage to buildings and infrastructure. Tropical cyclones are number three on the list of natural hazards that have the greatest potential to impact Lowndes County.

Profile of Tropical, Subtropical, & Extratropical Cyclone Events in Lowndes County & Municipalities, 1852 to 2005**					
Cyclones					
Date	**Name**	**Category**	**Loss of Life**	**Injuries**	**Financial Loss**
8/27/1852	Not Named	TS	Unk.	Unk.	Unknown
9/16/1859	Not Named	TS	Unk.	Unk.	Unknown
10/3/1893	Not Named	H1/TS	Unk.	Unk.	Unknown
8/21/1899	Not Named	TS	Unk.	Unk.	Unknown
7/29/1926	Not Named	TD	Unk.	Unk.	Unknown
10/4/1995	Opal	H1	2	0	$110,000,000*
9/16/2004	Ivan	H1	0	0	$3,700,000*
6/11/2005	Arlene	TS	0	0	$104,000*
7/10/2005	Dennis	TS	0	0	$250,000*
8/29/2005	Katrina	TS	0	8	$34,900,000*
Total	**10 events**		**2**	**8**	**$148,954,000***
*Notes: *Figures are from NCDC data and are statewide and not necessarily for just Lowndes County; figures not immediately available for Lowndes County. **With the exception of Ivan and the 2005 storms (2005 track data not available at the time of this analysis), the rest of the listed cyclones were those that directly traversed Lowndes County.*					
Sources: Historical North Atlantic Tropical Cyclone Tracks, National Hurricane Center, NOAA, 2004; Storm Events 1950-2005, NCDC, NOAA, 2006.					

Expansive Soils / Sinkholes

Sinkholes are caused by a loss of support, roof collapse and/or raveling. Loss of support occurs when decreases of groundwater reduce the buoyant support of groundwater cavities. The collapse of the cavity's roof causes a subsurface breach. Ravleing is the erosion of unconsolidated sediments and soils moving from one area into another underground gap. A visible sinkhole is created when the collapse of an unsupported cavity results in the magnification of the opening beyond the ability of the covering soil or rock material to bridge the opening.

Per the Geological Survey of Alabama (GSA) information, the southern edge of Lowndes County is located in an area of limestone and carbonate rock outcroppings that could be subject to sinkholes. GSA data also indicate that there have been no reported prior occurrences of sinkholes since the agency has been recording such events. The Lowndes Emergency Management Agency is also not aware of any known locations where active sinkholes have occurred in recent years.

However, the carbonate/limestone rock outcroppings in Lowndes County that could be subject to sinkholes tend to all be located along the valleys of streams and creeks where natural erosion also occurs. Since many of these streams also have associated floodplains, sinkholes and expansive soils are a concern.

Since there are no known locations of sinkhole activity, and the location and foundations of structures can be planned based on site specific soil data, there is no need to modify land use and development trends at this time. Furthermore, no buildings, infrastructure or cultural facilities are considered subject to sinkholes due to the lack of such activity during the recorded period.

NCDC tabulations do not report any losses associated with sinkholes or expansive soils in Lowndes County, and there is no known local database estimating actual or potential losses due to this type of hazard.

Wildfire

As defined by the Federal Emergency Management Agency, a wildfire is an uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures. Wildfires often begin unnoticed and spread quickly and are usually signaled by dense smoke that fills the area for miles around. Naturally occurring and non-native species of grasses, brush, and trees fuel wildfires. Wildfires are the number two hazard in Lowndes County due, in large part, to the presence forested land in the county. Of the total land in Lowndes County, 66.7 percent is in forested land – totaling almost 306,500 acres of forest land. Due to an expanding urban interface area, the threat of human danger from wildfires is steadily increasing in Lowndes County. Beyond loss of life, injury and property damage issues that arise from wildfires, the threat to the timber industry means that the overall economic well being of the county can be threatened by wildfires as well. The fact that the average annual value of stumpage timber sold in Lowndes County is over $8.6 million illustrates the point.

Profile of Wildfire Events in Lowndes County, 1995 to 2003

Wildfires			
Fiscal Year	**Number**	**Burned Acres**	**Avg. Size (Acres)**
1995	45	136.3	3
1996	24	249.1	10.4
1997	26	67	2.6
1998	35	171.8	4.9
1999	16	74.8	4.7
2000	82	508.4	6.2
2001	36	163.5	4.5
2002	39	262.4	6.7
2003	14	19.1	1.4
Total	**317 events**	**1652.4**	**5.2**

Source: Alabama Forestry Commission, 2004.

With the available information as presented, the Lowndes County LEPC determined that, while the risk is high, Lowndes County is moderately vulnerable to wildfires.

Potential impacts from wildfires include loss of life and injury; severe property damage; injury to victims and response personnel; smoke inhalation and toxic fumes; decreased visibility for vehicular traffic leading to a documented increase in auto accidents; threats to utility lines and poles, phone boxes and fiber optic lines. Additionally, there is a high incidence of repetitive losses due to wildfires in Lowndes County.

Secondary impacts from wildfires include a loss of tax revenue due to a loss of timber; erosion which leads to road and bridge deterioration; loss of habitat and a threat to endangered species; threatened water quality and stream sedimentation. The risks and vulnerability associated with wildfire are only increasing with continued urban sprawl.

Severe Thunderstorms / Windstorms / Hail

Thunderstorms are generated by atmospheric imbalance due to the combination of unstable warm air rising rapidly into the atmosphere, sufficient moisture to form clouds and rain, and an upward lift of air currents caused by colliding waterfronts, sea breezes, or mountains. Thunderstorms can produce tornados and floods (both discussed in other portions of this plan), hail, and high winds.

Severe thunderstorms, wind, and hail have been a common event for Lowndes County and its municipalities in the past and will continue to be so in the future. Between 1950 and 2005, 97 severe thunderstorms, wind, and hail events have occurred in Lowndes County and its municipalities, causing an estimated $364,000 in property and crop damages. In the past, there has been a minimal loss of critical facilities. However, the loss of critical facilities as a result of severe thunderstorms, wind, and hail are rare. In addition, there have been reports of minor property damage most being a result of lightning strikes or hail. Overall the impacts of severe thunderstorms, wind, and hail on Lowndes County have been negligible. As a result, it was determined that future impacts will most likely continue to be negligible meaning minor injuries may occur; critical facilities may be shut down for 24 hours or less, and less than ten percent of the property in the community would be damaged. Nonetheless, due to frequency in occurrence, the Lowndes County LEPC has ranked severe thunderstorms, wind, and hail as a Priority 1 natural hazard that has the greatest potential to impact Lowndes County. The LEPC determined that the county's vulnerability to extreme heat and drought is high.

Profile of Severe Thunderstorms, Wind, & Hail Events in Lowndes County & Municipalities, 1950-2005						
Severe Thunderstorms, Wind, & Hail						
Date	**Location**	**Hail (H) or Thunder-storm/ Wind (T)**	**Magnitude***	**Loss of Life**	**Injuries**	**Financial Loss**
4/12/1962	County	T	0	0	0	$0
3/6/1967	County	T	0	0	0	$0
4/7/1973	County	T	0	0	0	$0
5/23/1973	County	T	0	0	0	$0
11/26/1973	County	T	0	0	0	$0
2/21/1974	County	T	51	0	0	$0
3/21/1974	County	T	56	0	0	$0
6/12/1974	County	H	0.75"	0	0	$0
6/12/1974	County	T	0	0	0	$0
1/10/1975	County	T	65	0	0	$0
7/23/1976	County	T	0	0	0	$0
7/10/1981	County	T	0	0	0	$0
12/3/1983	County	T	0	0	0	$0
12/3/1983	County	T	0	0	0	$0
12/6/1983	County	T	0	0	0	$0
5/3/1984	County	H	1.75"	0	0	$0
5/3/1984	County	T	0	0	0	$0
5/3/1984	County	T	0	0	0	$0
5/3/1984	County	T	0	0	0	$0
4/15/1985	County	H	0.75"	0	0	$0
5/2/1985	County	H	0.75"	0	0	$0
5/2/1985	County	T	0	0	0	$0
6/7/1985	County	T	0	0	0	$0
9/23/1985	County	T	0	0	0	$0
2/10/1986	County	H	0.75"	0	0	$0
3/12/1986	County	T	0	0	0	$0
3/12/1986	County	T	0	0	0	$0
3/12/1986	County	T	0	0	0	$0
3/16/1986	County	H	0.75"	0	0	$0
5/18/1986	County	T	0	0	0	$0
4/25/1988	County	H	0.75"	0	0	$0
4/4/1989	County	H	0.75"	0	0	$0
5/27/1989	County	H	0.75"	0	0	$0
6/14/1989	County	T	0	0	0	$0
2/10/1990	County	T	0	0	0	$0
4/1/1990	County	T	0	0	0	$0
8/20/1990	County	T	0	0	0	$0
3/1/1991	County	T	0	0	0	$0
3/29/1991	County	T	0	0	0	$0

4/29/1991	County	T	0	0	0	$0
3/18/1992	County	T	0	0	0	$0
4/20/1992	County	T	0	0	0	$0
4/20/1992	County	T	0	0	0	$0
7/3/1992	County	T	0	0	0	$0
8/27/1992	County	T	0	0	0	$0
12/4/1993	County	T	N/A	0	0	$0
3/27/1994	County	H	1.75"	0	0	$0
7/11/1995	Hayneville	T	N/A	0	0	$3,000
8/15/1995	County	T	N/A	0	0	$3,000
3/6/1996	Lowndesboro	T	50	0	0	$15,000
3/16/1996	Hayneville	H	1.75"	0	0	$15,000
6/16/1997	Ft. Deposit	H	0.75"	0	0	$3,000
11/21/1997	Hayneville	T	50	0	0	$35,000
3/8/1998	Lowndesboro	H	1.00"	0	0	$0
3/20/1998	Lowndesboro	H	1.25"	0	0	$0
4/30/1998	Hayneville	H	0.75"	0	0	$0
5/3/1998	Lowndesboro	H	0.75"	0	0	$0
6/20/1998	Hayneville	T	50	0	0	$5,000
3/3/1999	Hayneville	T	55	0	0	$15,000
1/9/2000	Lowndesboro	H	0.88"	0	0	$0
4/2/2000	White Hall	H	1.00"	0	0	$3,000
4/2/2000	Lowndesboro	H	1.00"	0	0	$0
8/10/2000	Hayneville	T	50	0	0	$1,000
8/10/2000	White Hall	T	50	0	0	$2,000
1/19/2001	Hayneville	T	50	0	0	$3,000
4/30/2002	Lowndesboro	H	1.00"	0	0	$0
3/9/2003	Ft. Deposit	H	1.75"	0	0	$5,000
3/9/2003	Ft. Deposit	H	0.75"	0	0	$0
4/7/2003	County (Collirene)	T	55	0	0	$5,000
4/7/2003	Hayneville	T	50	0	0	$5,000
4/7/2003	Lowndesboro	T	55	0	0	$20,000
4/25/2003	White Hall	H	1.00"	0	0	$0
4/25/2003	Lowndesboro	H	1.00"	0	0	$20,000
5/2/2003	Ft. Deposit	H	0.88"	0	0	$0
10/19/2004	County (Braggs)	T	50	0	0	$2,000
11/24/2004	Lowndesboro	T	52	0	0	$14,000
2/22/2005	Lowndesboro	H	1.00"	0	0	$0
3/7/2005	County	T	50	0	0	$2,000
3/26/2005	Lowndesboro	H	0.88"	0	0	$0
3/27/2005	Ft. Deposit	H	1.75"	0	0	$11,000
3/27/2005	Ft. Deposit	H	1.75"	0	0	$8,000
3/27/2005	Hayneville	H	0.88"	0	0	$0
3/27/2005	Ft. Deposit	H	0.75"	0	0	$0
3/27/2005	Ft. Deposit	H	0.75"	0	0	$0
3/27/2005	White Hall	H	0.75"	0	0	$0

3/27/2005	Ft. Deposit	T	50	0	0	$4,000
3/30/2005	County (Braggs)	H	1.75"	0	0	$18,000
4/21/2005	County (Braggs)	H	1.00"	0	0	$1,000
4/21/2005	White Hall	T	51	0	0	$3,000
4/22/2005	White Hall	H	1.75"	0	0	$5,000
4/22/2005	White Hall	H	1.75"	0	0	$5,000
4/22/2005	Hayneville	H	1.00"	0	0	$1,000
4/22/2005	County (Braggs)	H	0.75"	0	0	$1,000
4/22/2005	Ft. Deposit	H	1.75"	0	0	$4,000
4/30/2005	Hayneville	T	60	0	4	$100,000
4/30/2005	White Hall	T	55	0	0	$26,000
11/28/2005	Hayneville	H	1.75"	0	0	$1,000
TOTAL	**97 events**			**0**	**4**	**$364,000**
JURISDICTIONAL SUMMARY						
Benton	0 events			0	0	$0
Fort Deposit	10 events			0	0	$35,000
Gordonville	0 events			0	0	$0
Hayneville	13 events			0	4	$184,000
Lowndesboro	12 events			0	0	$69,000
Mosses	0 events			0	0	$0
White Hall	8 events			0	0	$44,000
Unincorporated Areas	54 events			0	0	$32,000
Note: *Magnitude for hail events is depicted as the average diameter of hail stones. Magnitude for thunderstorm and wind events is expressed in knots.						
Source: Storm Events 1950-2005, NCDC, NOAA, 2006.						

Drought

Drought is a prolonged period of dry weather due to a lack of rain. The National Oceanic and Atmospheric Administration reports that the annual normal daily mean temperature for Montgomery, which is the closest station to Lowndes County, between 1971 and 2000 is 65.1 degrees Fahrenheit, with the warmest month being July at 81.8 degrees Fahrenheit and the coldest month being January at 46.6 degrees Fahrenheit. The annual normal monthly precipitation during the same time period is 54.77 inches with an average of 108 days per year with precipitation of more than .01 inch. Lowndes County's economic dependence upon agriculture, coupled with the low per capita income of the county, at $12,457 according to the 2000 Census, makes the county population very susceptible to extreme changes in weather. Drought conditions affect the population's ability to produce livable earnings and produce dangerous living conditions for the low-income sector of the population due to an inability to find adequate refuge from drought and drought-related heat conditions.

The Lowndes County LEPC determined that the county's vulnerability to drought is moderate with the most severe threat being to county's elderly and low-income population. Drought also places an increased demand on medical services and emergency response services that are already in short supply. Additional impacts on the county due to drought include increased road cracking and road repairs resulting in higher maintenance costs and inaccessibility to some portions of the county; increased power and water usage resulting in higher payments and sometimes higher rates; increased fire potential; increased loss of vegetation and property damage with the most significant threat to agricultural production including crops, timber and livestock; an increased threat to the quantity and quality of water supplies; and increased anxiety in the population which can result in increased crime.

Profile of Priority 1 Storm Events in Lowndes County & Municipalities, 1852-2005								
All Priority 1 Storm Events*								
Location**	**Type**					**Loss of Life**	**Injuries**	**Financial Loss*****
	F	**Tor.**	**Hur.**	**Th.**	**H**			
Lowndes County (Countywide)	6		10			2	8	$149,090,000
Lowndes County (Unincorporated Communities)	0	5		2	3	3	43	$76,000
Lowndes County (Unknown)	0	9		39	10	0	23	$1,080,000
Town of Benton	0	0		0	0	0	0	$0
Town of Fort Deposit	0	1		1	9	0	0	$35,000
Town of Gordonville	0	1		0	0	0	2	$125,000
Town of Hayneville	1	0		8	5	0	4	$186,000
Town of Lowndesboro	0	2		3	9	0	2	$69,000
Town of Mosses	0	0		0	0	0	0	$0
Town of White Hall	0	1		3	5	0	1	$154,000
TOTALS	**7**	**19**	**10**	**56**	**41**	**5**	**83**	**$150,815,000**
Key: Th. = Severe Thunderstorms/Winds; H = Hail; Tor. = Tornados; F = Flooding; Hur. = Hurricanes/Tropical Storms								
*Notes: *Does not include wildfire or sinkholes. **Countywide events are not counted under the municipalities. ***Hurricane/Tropical Storm dollar figures are from NCDC data and are statewide; figures not immediately available for Lowndes County.*								
Sources: Storm Events 1950-2005, NCDC, NOAA, 2006; and Alabama Tornado Database, NWS, NOAA, 2006.								

Probability

The probability (%) that an identified hazard of Priority 1 status will occur on an annual basis was determined using the following formula:

Number of historical or reported events in that time period / Number of years incidents occurred within = Probability of A Future Annual Event

A similar formula was used to determine an estimate of the expected damages from each event:

Total amount of damages (in dollars) for each historical or reported event / Number of damage causing events within the time period = Damage Expectations Per Damaging Event

Priority 1 Event Probability for Lowndes County & Municipalities			
Natural Hazard Events	**Number of Historical Events**	**Probability of A Future Annual Event**	**Damage Expectations Per Damaging Event (in $)***
County & Municipalities			
Flooding (1950-2005; 55)	7	13%	$22,429
Tornado (1882-2003; 121)	19	16%	$71,526
Hurricane/Tropical Storm (1852-2005; 153)**	10	7%	$14,895,400
Wildfires (1995-2003; 8)**	317	>100%	Not available
Severe Thunderstorm/Wind (1950-2005; 55)	56	>100%	$4,696
Hail (1950-2005; 55)	41	75%	$2,463
Drought (1950-2005; 55)	0	Unk.	Unknown or $0
Benton			
Insufficient data: No recorded local events			
Fort Deposit			
Tornado (1882-2003; 121)	1	1%	Unknown or $0
Severe Thunderstorm/Wind (1950-2005; 55)	1	2%	$4,000
Hail (1950-2005; 55)	9	16%	$3,444

Gordonville			
Tornado (1882-2003; 121)	1	1%	$125,000
Severe Thunderstorm/Wind (1950-2005; 55)	1	2%	Unknown or $0
Hail (1950-2005; 55)	1	2%	Unknown or $0
Hayneville			
Flooding (1950-2005; 55)	1	2%	$2,000
Severe Thunderstorm/Wind (1950-2005; 55)	8	15%	$20,875
Hail (1950-2005; 55)	5	9%	$3,400
Lowndesboro			
Tornado (1882-2003; 121)	2	2%	Unknown or $0
Severe Thunderstorm/Wind (1950-2005; 55)	3	5%	$16,333
Hail (1950-2005; 55)	9	16%	$2,222
Mosses			
Insufficient data: No recorded local events			
White Hall			
Tornado (1882-2003; 121)	1	1%	$110,000
Severe Thunderstorm/Wind (1950-2005; 55)	3	5%	$31,000
Hail (1950-2005; 55)	5	9%	$13,000
Unincorporated Areas			
Flooding (1950-2005; 55)	6	11%	$25,833
Tornado (1882-2003; 121)	14	12%	$80,286
Severe Thunderstorm/Wind (1950-2005; 55)	40	73%	$300
Hail (1950-2005; 55)	13	24%	$1,538
*Notes: *Some historical damage figures for certain types of events were unknown, not recorded, or not immediately available (esp. wildfires). **These events occurred on a countywide basis and therefore not factored into the separate listings for each municipality.*			
Sources: Storm Events 1950-2005, NCDC, NOAA, 2006; Alabama Tornado Database, NWS, NOAA, 2006; Historical North Atlantic Tropical Cyclone Tracks, National Hurricane Center, NOAA, 2005; and Alabama Forestry Commission, 2004.			

Structural Assets and Impacts

An inventory of assets and critical facilities susceptible to the identified Priority 1 hazards within Lowndes County has been attempted. At the time of this plan's submission to AEMA and FEMA, a complete inventory has not been completed. Values for the different types of buildings (i.e., residential, commercial, industrial, agricultural, institutional, governmental/educational, and utilities) in Lowndes County has not been performed. The Lowndes County EMA and LEPC intend to have this information collected and analyzed by the next five-year major update. Such an analysis should describe the vulnerability of the types and numbers of existing and potential future buildings, infrastructure, and critical facilities located in specific hazard areas. Building values should be obtained from the Lowndes County Tax Assessor's Office and/or from each jurisdiction's property insurance providers. Of the Priority 1 hazards, only flooding and expansive soils/sinkholes pose a localized risk to buildings and structures in certain areas – primarily in the built areas lying in or along the identified floodplains and on carbonate rock outcroppings. Otherwise, all buildings and structures within Lowndes County are vulnerable to all natural hazards identified as being Priority 1.

Impacts on Population

As stated in the section above, the entire area of Lowndes County is vulnerable to all identified Priority 1 natural hazards with the exception of flooding and expansive soils/sinkholes. Population figures and number of households vulnerable to the identified Priority 1 hazards are as follows:

Lowndes County Population Vulnerable to Priority 1 Hazards

Priority 1 Hazard	Population	Households
County & Municipalities		
Flooding	7,667	2,840
Tornado	13,473	4,909
Hurricane/Tropical Storm	13,473	4,909
Expansive Soils/Sinkhole	1,049	364
Wildfire	13,473	4,909
Severe Thunderstorm/Wind/Hail	13,473	4,909
Drought	13,473	4,909
Benton		
Flooding	47	18
Tornado	47	18
Hurricane/Tropical Storm	47	18
Expansive Soils/Sinkhole	0	0
Wildfire	47	18
Severe Thunderstorm/Wind/Hail	47	18
Drought	47	18

Fort Deposit		
Flooding	40	17
Tornado	1,270	489
Hurricane/Tropical Storm	1,270	489
Expansive Soils/Sinkhole	133	51
Wildfire	1,270	489
Severe Thunderstorm/Wind/Hail	1,270	489
Drought	1,270	489
Gordonville		
Flooding	140	54
Tornado	318	112
Hurricane/Tropical Storm	318	112
Expansive Soils/Sinkhole	0	0
Wildfire	318	112
Severe Thunderstorm/Wind/Hail	318	112
Drought	318	112
Hayneville		
Flooding	24	18
Tornado	1,177	409
Hurricane/Tropical Storm	1,177	409
Expansive Soils/Sinkhole	0	0
Wildfire	1,177	409
Severe Thunderstorm/Wind/Hail	1,177	409
Drought	1,177	409
Lowndesboro		
Flooding	0	0
Tornado	140	58
Hurricane/Tropical Storm	140	58
Expansive Soils/Sinkhole	0	0
Wildfire	140	58
Severe Thunderstorm/Wind/Hail	140	58
Drought	140	58
Mosses		
Flooding	301	105
Tornado	1,101	364
Hurricane/Tropical Storm	1,101	364
Expansive Soils/Sinkhole	0	0
Wildfire	1,101	364
Severe Thunderstorm/Wind/Hail	1,101	364
Drought	1,101	364
White Hall		
Flooding	884	316
Tornado	1,014	361
Hurricane/Tropical Storm	1,014	361
Expansive Soils/Sinkhole	0	0

Wildfire	1,014	361
Severe Thunderstorm/Wind/Hail	1,014	361
Drought	1,014	361
Unincorporated Areas		
Flooding	6,278	2,330
Tornado	8,406	3,098
Hurricane/Tropical Storm	8,406	3,098
Expansive Soils/Sinkhole	916	313
Wildfire	8,406	3,098
Severe Thunderstorm/Wind/Hail	8,406	3,098
Drought	8,406	3,098
*Notes: *These values are estimates based on aggregate land areas (i.e., Census blocks) falling into vulnerable regions (i.e., floodplains and carbonate rock outcroppings) assuming even population distribution across the enumeration units. Due to such, figures for all areas may be inflated.*		
Sources: U.S. Census Bureau, Census 2000; FEMA NFIP FIRMs, Lowndes County, Alabama (Incorporated & Unincorporated Areas); and Geologic Survey of Alabama, Geologic Hazards Program, 2006.		

Critical Facilities

The process of determining Lowndes County's risk and vulnerability to natural hazards enabled the Lowndes County LEPC to identify critical facilities that would be impacted in the event of a disaster event. The LEPC identified critical facilities located in Lowndes County, based on two types of criteria: (1) Buildings or locations vital to the response and recovery effort, such as police and fire stations and telephone exchanges; and (2) Buildings or locations that, if damaged, would create secondary disasters, such as hazardous materials facilities and nursing homes. The critical facilities were grouped into one of seven categories as shown in the list on the following page.

As of the submission of this plan, a complete inventory of critical facilities susceptible to the identified Priority 1 hazards within Lowndes County has been attempted, but not completed. Exact locations and facility values are still being researched and assessed. With the exceptions of flooding and expansive soils/sinkholes, all of the critical facilities are vulnerable to all of the identified Priority 1 natural hazards. The appropriate utility companies and departments, and the local governments, have been asked for this information, and several are still researching this information. The Lowndes County EMA and LEPC intend to have this information collected and analyzed by the next five-year major update.

Lowndes County Critical Facilities	
Continuity of Government	**Water, Sewer, and Solid Waste Utilities**
Lowndes County Courthouse Lowndes County Courthouse Annex Benton Town Hall Board of Education Extension Office (Hayneville)	Black Belt Water System Lowndes Co. Water Authority Fort Deposit Water & Sewer Board Hayneville Water Department Lowndes Co. Water Authority Lowndesboro Water Authority Lowndes Garbage Service Mosses Water & Fire Protection Authority Pintlala Water & Fire Protection Authority Sellers Station Water System White Hall Water System
Law Enforcement	**Hospitals/Health Care Agencies**
Lowndes Co. Sheriff's Office Lowndes Co. Jail Fort Deposit PD Hayneville PD White Hall PD	Energy Stat (Hayneville) Family Medical Center (Fort Deposit) Family Medical Center (White Hall) Hayneville Health Services (Hayneville) Lowndes Co. Health Department West Alabama Health Services (Hayneville) Yearwood Medical Center (Ft. Deposit)
Disaster Coordination and Support Agencies / Social Services	**Electric Power & Gas Utilities**
Lowndes Co. Emergency Mgmt Agency Lowndes Co. Dept. of Human Resources Citizen Corps Volunteers	Acme Propane Alabama Power Dixie Electric Cooperative Dowdle Propane Pioneer Electric Cooperative Southeast Alabama Gas District
Water Sources	**Telephone, Cable, & Communications**
Aquifers: Eutaw, Gordo, Nanafalia, Ripley, Tuscaloosa, and Watercourse formations	BellSouth Hayneville Communications
Fire Protection	**Schools**
Braggs VFD Burkville VFD Fort Deposit VFD Hayneville FD Mosses VFD Sandy Ridge FD White Hall VFD	Lowndes Co. Board of Education (Hayneville) Calhoun High School (Letohatchee) Central Elementary School (Gordonsville) Central High School (Gordonsville) Fort Deposit Elementary School (Ft. Deposit) Hayneville Middle School (Hayneville) Jackson-Steele Elementary School (White Hall) Lowndes Co. Career & Technical Center (Hayneville)

	Lowndes Co. Middle School (Ft. Deposit) Project Success Learning Center (Hayneville) Key of Life School (Letohatchee) Lowndes Academy (Lowndesboro)
Mass Care Shelters	**Transportation**
All Public Schools	Church buses (various) Lowndes Co. Board of Education buses West Alabama Rural Transportation (Hayneville)
Adult & Child Daycare	**Other**
Orchard Nursing Home (Hayneville)	Ark of Love Skills Training Center (Mosses) Bancorp (Hayneville & Burkville) Bell Enterprises (Hayneville) Bell Funeral Homs (Hayneville) D&K Pharmacy (Ft. Deposit) Farm & Home Supply (Ft. Deposit) First Lowndes Bank (Hayneville & Ft. Deposit) Green Chapel (Hayneville) Hayneville Drug (Hayneville)
Source: Lowndes County LEPC, 2006.	

Estimated Losses

The below table depicts general estimates of property damage that could result from each of the identified Priority 1 hazards based on historical data per event average in Lowndes County and all seven municipalities. These are gross estimates of yearly damages and should only be interpreted as indicators of the degree of damage possible. The figures are based solely on past occurrences, as described in other parts of this plan. More accurate methods are available to assess damages, particularly the U.S. Army Corps of Engineers' Flood Damage Assessment (HEC-FDA) model, FEMA's Benefit-Cost Modules, and the HAZUS loss estimation software. The Lowndes County EMA and LEPC intend to conduct more detailed loss estimates by applying the latest version of HAZUS-MH for multi-hazard assessments, and have this information analyzed by the next five-year major update.

Estimated Loss Projections Resulting From Priority 1 Hazards					
Hazard	**Average Occurrences** (per year)	**Total Deaths**	**Total Injuries**	**Average Crop and Property Loss** (per event/per year)	**Maximum Historical Property Loss** (per event)
Flooding	0.13	0	0	$22,429 / $2,855	$60,000
Tornado	0.16	5	93	$71,526 / $11,231	$250,000
Hurricane/Tropical Storm	0.07	2	8	*	*
Expansive Soils/Sinkhole	0.00	0	0	**	**
Wildfires	39.63	***	***	***	***
Severe Thunderstorm/Wind	1.02	0	4	$4,696 / $4,782	$100,000
Hail	0.75	0	0	$2,463 / $1,836	$20,000
Drought	0.00	0	0	**	**
*Notes: *The potential for damages from hurricanes and other major cyclonic events does exist within Lowndes County. However, county specific damage estimates were not available. **The potential for damages from expansive soils/sinkholes and drought does exist. However, per NCDC data, there have been no recorded instances of such occurring in the county. County specific damage estimates were not available. ***The potential for wildfire damages within Lowndes County does exist. The figures for wildfire damages under these columns were not available at this time, however.*					
Sources: Storm Events 1950-2005, NCDC, NOAA, 2006; Alabama Tornado Database, NWS, NOAA, 2006; Historical North Atlantic Tropical Cyclone Tracks, National Hurricane Center, NOAA, 2005; and Alabama Forestry Commission, 2004.					

Development Patterns

Lowndes County is centrally located in the State and is largely rural, with the primary land uses being agriculture. Fort Deposit, the largest municipality, is located in the southeastern corner of the county, along Interstate 65. Other land uses in the county consist of: industrial areas, located primarily along major highways (e.g., GE Plastics near U.S. Highway 80 in Burkville and the various Hyundai automotive suppliers, such as Daehan Solution Corporation, located near Interstate 65); commercial located in each of the seven municipalities, in downtown areas and along major roads; residential areas, mostly located throughout the seven municipalities, and in very small pockets throughout the county; farmland, which is located throughout the county, but usually near streams and lower elevations; forests, located throughout the county, but especially in the southwestern half of the county; and various specialized lands uses (institutional, mixed, etc.) located in the seven municipalities, but especially in municipalities like Fort Deposit, Hayneville, and White Hall. Land uses within the municipalities are generally in conformance with current zoning and land use regulations, and are expected to remain in the current use for the foreseeable future.

The remainder of the county is not expected to undergo significant development pressure and there are not any anticipated changes in land use for the near future.

V. HAZARD MITIGATION STRATEGY

The Hazard Mitigation Strategy outlines methods, or action steps, for implementation of the Lowndes County Natural Hazard Mitigation Plan over a five year time period. The strategy includes goals and objectives that were developed to guide the development of the plan and the subsequent mitigation efforts. The goals and objectives are followed by specific mitigation action steps to be implemented. The list of action steps includes an estimated cost per item and designates who the responsible agency or agencies should be. The final portion of the mitigation strategy is a five-year time schedule and cost breakdown per year for implementation. With input by from the governments and non-governmental organizations represented on the LEPC, and from public input received at the public meetings, the following goals and objectives were established by the LEPC to guide hazard mitigation efforts on an on-going basis beyond the five-year time frame of the implementation strategy. These goals and objectives were established for the County and all of its municipalities.

Goal A: Promote natural hazard mitigation as a means to decrease loss of life, property damage and economic loss during a disaster occurrence.

Objective A-1: Establish a full warning system for notification of impending disasters throughout Lowndes County.

Objective A-2: Ensure that adequate protection shelters are available for use during disaster occurrences.

Objective A-3: Develop and adopt, or amend, and enforce land use regulations and ordinances and modern building codes that support natural hazard mitigation efforts throughout Lowndes County.

Objective A-4: Implement fire protection measures to decrease potential for loss of life and property damage.

Objective A-5: Limit impact of heat and drought on human health, property damage, and agricultural losses.

Objective A-6: Improve infrastructural facilities and remove at-risk commercial and residential buildings to limit the impact of natural hazard events.

Objective A-7: Investigate, prepare, and provide for mitigation and emergency services and activities before, during, and after a disaster event.

Goal B: Provide on-going support of the Lowndes County Emergency Management efforts to make Lowndes County less vulnerable to natural disasters.

Objective B-1: Ensure that the Lowndes County Hazard Mitigation Plan remains current and is implemented.

Objective B-2: Improve coordination and communication between emergency response organizations and highly vulnerable entities.

Objective B-3: Enhance the County's and municipalities' capability to conduct further hazard risk assessments, better demonstrate funding needs, and track mitigation activities throughout the County.

Goal C: Educate general population about natural hazards and hazard mitigation options.

Objective C-1: Establish and implement hazard mitigation public awareness programs.

Objective C-2: Establish and promote disaster prevention education programs, utilizing all forms of media (e.g., print, TV, internet websites - government and related non-governmental) to help distribute information and materials.

Lowndes County Hazard Mitigation Action Steps

Goal A: Promote natural hazard mitigation as a means to decrease loss of life, property damage and economic loss during a disaster occurrence.

Objective A-1: Establish a full warning system for notification of impending disasters throughout Lowndes County.	**Estimated Cost Over 5 Years**	**Funding Source** / **Responsible Agency**
a. Develop a warning plan to install approximately 35 sirens at targeted sites to adequately cover population pockets in Lowndes County.	$585,000.00	Federal, State & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Lowndes Co. EMA
b. Designate a central emergency coordinator in each municipality and community to better facilitate communications with the Lowndes County Emergency Management Agency.	$0.00	County & Municipal
Geographic Beneficiaries & Jurisdictions: County Unincorporated Communities (based on VFDs) and All Municipalities		All Municipalities
c. Construct warning signage for limited visibility due to forest/wild fires on major roads in targeted areas.	$20,000.00	Federal, State & County
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		County Road Dept.
d. Investigate use of phone messaging system to provide warning of all impending hazardous conditions.	$0.00	County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Lowndes Co. EMA
Total	**$605,000.00**	

Objective A-2: Ensure that adequate protection shelters are available for use during disaster occurrences.	**Estimated Cost Over 5 Years**	**Funding Source**
		Responsible Agency
a. Maintain and expand existing shelter facilities to provide adequate pre-disaster care and space, as needed.	$3,000.00	Federal, State, County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		County, All Municipalities & Shelter Operators
b. Designate and upgrade/retrofit, as necessary, existing public and institutional facilities to provide shelter in areas of Lowndes County where there currently are no shelters, primarily targeting schools, churches, and community centers, at a rate of one site every two years.	$37,500.00	Federal, State, County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		County, All Municipalities & Shelter Operators
c. Investigate construction of new public shelter facilities in those areas of the county with no shelter facilities as long-term and low-priority task.	$0.00	County
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Lowndes Co. EMA
d. Secure funds to continue efforts to assist citizens in constructing private shelters on their land at a rate of seven shelters per year. (Approx. $5,000 per shelter)	$175,000.00	Federal & Private
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Lowndes Co. EMA
e. Work with developers, homebuilders and contractors to promote construction of a safe room in all new residential development.	$0.00	County & Municipal

Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Lowndes Co. EMA, & County & All Municipal Building/Planning Officials
f. Publicize information on locations of existing public shelters and when to use them.	$2,500.00	County, Municipal, Red Cross & DHR
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		County, All Municipalities, Lowndes Co. EMA, Red Cross & DHR
Total	**$218,000.00**	

Objective A-3: Develop and adopt, or amend, and enforce land use regulations and ordinances and modern building codes that support natural hazard mitigation efforts throughout Lowndes County.	**Estimated Cost Over 5 Years**	**Funding Source** **Responsible Agency**
a. Incorporate and enforce flood management provisions in all county and municipal land use and zoning ordinances and regulations.	$0.00	County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		County & All Municipal Building/Planning Officials
b. Ensure that future land use and growth plans do not extend into flood plain areas.	$0.00	County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		County & All Municipal Building/Planning Officials
c. Develop long-range growth and development plan for Lowndes County to address permitting and construction process in unincorporated areas.	$40,000.00	Federal, State & County
Geographic Beneficiaries & Jurisdictions: County Unincorporated Communities		County Engineer/Planning Official

d. Adopt and enforce modern building codes (e.g., the 2003 International Building Code or the NFPA 5000) at the county and municipal levels.	$0.00	County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		County & All Municipal Building/Planning Officials
e. Ensure that the Lowndes County Emergency Management Agency is involved in the review of all local future growth and development plans.	$12,500.00	County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		County & All Municipal Building/Planning Officials
f. Identify and obtain properties in floodplains to be used for greenways, open spaces, parks, trails, and other recreational activities.	$25,000.00	Federal, State, County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		County & All Municipal Recreation & Planning Officials
g. Promote and encourage the County and municipalities that are located in known floodplains, and that are not participating in and/or are sanctioned by FEMA's National Flood Insurance Program, to join/rejoin the NFIP.	$0.00	County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities located in known floodplains		Municipal Building/Engineering/Planning Officials & Councils/Mayors
Total	**$77,500.00**	

Objective A-4: Implement fire protection measures to decrease potential for loss of life and property damage.	**Estimated Cost Over 5 Years**	**Funding Source** **Responsible Agency**
a. Develop and utilize zoning ordinances to manage development in urban fringe areas.	$0.00	Federal, State, County & Municipal
Geographic Beneficiaries & Jurisdictions: All Municipalities		County & All Municipal Building/Planning Officials
b. Establish education program to provide information on methods to construct buffers and fire breaks on private property in wildland interface areas.	$0.00	Federal, State, County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Lowndes Co. EMA, & All County & Municipal Fire Protection Authorities
c. Support Alabama Forestry Commission efforts to help educate private landowners to protect their own and other's property through construction of fire lanes and fire breaks on forested property, making landowners aware of both their responsibility and liability.	$0.00	County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Lowndes Co. EMA, & County & All Municipal Fire Protection Authorities, & County & All Municipal Building/Planning Officials
Total	**$0.00**	

Objective A-5: Limit impact of heat and drought on human health, property damage and agricultural losses	**Estimated Cost Over 5 Years**	**Funding Source** **Responsible Agency**
a. Work with the County and municipalities to implement public awareness and education efforts about water conservation and water quality.	$0.00	County, Municipal & Water Suppliers
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Lowndes Co. EMA & Water Suppliers
b. Work with Lowndes County medical providers to develop emergency supplies and education program.	$0.00	County, Municipal & Medical Providers
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Lowndes Co. EMA, County Health Dept. & Medical Providers
c. Work with Lowndes County Farm Service Agency and County Extension Service to establish a drought information center.	$0.00	Federal, State, County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		County
d. Develop a drought and heat indicator plan and warning system that includes a response strategy.	$0.00	State, County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Lowndes Co. EMA, Lowndes County Farm Service Agency & County Extension Service
e. Develop print public service announcements.	$2,500.00	State, County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Lowndes Co. EMA, Lowndes County Farm Service Agency & County Extension Service
Total	**$2,500.00**	

Objective A-6: Improve infrastructural facilities and remove at-risk commercial and residential buildings to limit the impact of natural hazard events.	**Estimated Cost Over 5 Years**	**Funding Source** **Responsible Agency**
a. Identify roads that require elevation and paving, and that have a high potential for flooding and/or washing during flood events, to provide access and limit erosion and sedimentation.	$0.00	State, County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		State, County & All Municipal Road Depts.
b. Continue bridge inspection and improvement efforts to prevent washing and/or failure during flood events.	$7,000,000.00	Federal, State, County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		State, County & All Municipal Road Depts.
c. Maintain all county roads to allow constant access for emergency response, recovery and repair, and continuity of delivery services at eight roads per year.	$5,000,000.00	Federal, State & County
Geographic Beneficiaries & Jurisdictions: County Unincorporated Communities		State & County Road Depts.
d. Utilize AEMA Flood Relocation Program and other appropriate FEMA and/or AEMA programs to remove at-risk commercial and residential structures from flood prone and other natural hazard areas, if necessary in the future.	$500,000.00	Federal, State, County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Lowndes Co. EMA, & County & All Municipal Engineers
Total	**$12,500,000.00**	

Objective A-7: Investigate, prepare, and provide for mitigation and emergency services and activities before, during, and after a disaster event.	**Estimated Cost Over 5 Years**	**Funding Source**
		Responsible Agency
a. Investigate need for emergency water supply during disaster events.	$0.00	State, County, Municipal & Water Suppliers
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Lowndes Co. EMA & Water Suppliers
b. Limit non-critical water consumption during severe drought conditions.	$0.00	County, Municipal & Water Suppliers
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		County, All Municipalities & Water Suppliers
c. Conduct inventory of the county's emergency response services to identify any existing needs or shortfalls in terms of personnel, equipment, or required resources.	$0.00	County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Lowndes Co. EMA & All Emergency Services Agencies in County
d. Investigate the need and feasibility of establishing a local reserve fund for repairing and/or incorporating hazard mitigation measures for public and private facilities and infrastructure that are at risk of being damaged or have been damaged by natural hazards.	$0.00	County, Municipal & Private
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		County Commission & All Municipal Councils
e. Continue to research and provide hazard mitigation, emergency preparedness, and disaster recovery grant writing and/or administration services for available grant and loan programs (e.g., AFGP, FMA, HMGP, PDM, etc.).	$0.00	County & Municipal

Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Lowndes Co. EMA , County Commission & All Municipalities
f. Investigate the need for and acquire emergency electrical power generation equipment to provide back-up emergency electrical power to critical facilities.	$150,000.00	Federal, State, County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Lowndes Co. EMA , County Commission & All Municipalities
Total	**$150,000.00**	

Goal B: Provide on-going support of the Lowndes County Emergency Management efforts to make Lowndes County less vulnerable to natural disasters.

Objective B-1: Ensure that the Lowndes County Hazard Mitigation Plan remains current and is implemented.	**Estimated Cost Over 5 Years**	**Funding Source** / **Responsible Agency**
a. Update the Lowndes County Hazard Mitigation Plan every five years as required by regulations.	$7,000.00	Federal, State, & County
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Lowndes Co. EMA & LEPC
b. Communicate with the general public at least annually to provide a status report of the plan and any project or programs that are a result of the plan and its implementation.	$12,500.00	County
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Lowndes Co. EMA
c. Municipalities should provide local human resources or other resources, such as materials and supplies, to assist in implementation of the Lowndes County Hazard Mitigation Plan and its regular update.	$25,000.00	Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		All Municipalities
Total	**$44,500.00**	

Objective B-2: Improve coordination and communication between emergency response organizations and highly vulnerable entities.	**Estimated Cost Over 5 Years**	**Funding Source** / **Responsible Agency**
a. Designate a central emergency coordinator in each municipality and community to better facilitate communications with the Lowndes County Emergency Management Agency.	$0.00	County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		County Commission & All Municipal Councils/Mayors
b. Provide for incident command training for the local emergency coordinators and other responders.	$2,000.00	Federal, State, County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Lowndes Co. EMA
c. Develop an on-going cycle to provide regular updates to the Lowndes County Commission, municipal councils, fire protection and law enforcement officials, utility boards, and other emergency responders.	$7,500.00	County
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Lowndes Co. EMA
d. Investigate the need and feasibility of upgrading communications systems and increasing coverage and compatibility across the entire county and its municipalities.	$0.00	County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Lowndes Co. EMA & All Municipal Emergency Response Entities
Total	**$9,500.00**	

Objective B-3: Enhance the County's and municipalities' capability to conduct further hazard risk assessments, better demonstrate funding needs, and track mitigation activities throughout the County.	**Estimated Cost Over 5 Years**	**Funding Source** **Responsible Agency**
a. Continue to identify the County's most at-risk critical facilities, and evaluate the potential mitigation techniques and activities for protecting each facility to the maximum extent possible.	$0.00	County, Municipal & All Utilities
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Lowndes Co. EMA & LEPC, All County & Municipal departments, & All Utilities
b. Incorporate (or continue) development of a Geographic Information System (GIS) to maintain current cadastral and spatial data for purposes of inventorying critical facilities and infrastructure, conducting more detailed hazard risk assessments, and for tracking permitting and land use patterns.	$176,000.00	State, SCADC, County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		State, SCADC, Lowndes Co. EMA, E-911, Tax Assessor, All County & Municipal Engineers & Building/Planning Officials, & All Utilities
Total	**$176,000.00**	

Goal C: Educate general population about natural hazards and hazard mitigation options.

Objective C-1: Establish and implement hazard mitigation public awareness program.	**Estimated Cost Over 5 Years**	**Funding Source** / **Responsible Agency**
a. Cooperate and coordinate with various agencies and entities to assist with distribution of information and materials, including the various Chambers of Commerce, DHR, Lowndes County Board of Education, churches, municipalities, etc.	$2,500.00	County, Municipal & Private
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Lowndes Co. EMA & the listed entities
b. Develop a portable information booth for display at local fairs and public events to distribute materials.	$5,500.00	County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Lowndes Co. EMA
c. Create and distribute magnets that list all emergency contact information of local responding agencies.	$2,500.00	County, Municipal & Private
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Lowndes Co. EMA & All Municipalities
d. Investigate and develop strategies that will help protect citizens from pandemic influenza, and cooperate and coordinate with state and county public health and agricultural authorities to educate the public of such protective measures.	$0.00	USHHS, USDA, State, County, Municipal & Private
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Lowndes Co. EMA and Health Dept., & All Municipalities
Total	**$10,500.00**	

Objective C-2: Establish and promote disaster prevention education programs, utilizing all forms of media (e.g., print, TV, internet websites - government and related non-governmental) to help distribute information and materials.	**Estimated Cost Over 5 Years**	**Funding Source** **Responsible Agency**
a. Investigate working with Lowndes County Extension System to develop adult training/certification courses on land management (best management practices) to decrease property damage during natural disaster events.	$20,000.00	USDA & County
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Lowndes Co. EMA
b. Develop broadcast public service announcements for airing on local television and radio stations.	$15,000.00	County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Lowndes Co. EMA
c. Develop print public service announcements for publication in local newspaper and agency newsletters.	$2,500.00	County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Lowndes Co. EMA
d. Develop information website with links from Lowndes County Commission and municipal websites.	$4,400.00	County, Municipal & Private
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Lowndes Co. EMA
e. Incorporate hazard awareness and mitigation into the curricula of local schools.	$7,000.00	State & County
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Lowndes Co. Board of Education
f. Develop coloring and activity books at four appropriate age levels for widespread annual distribution.	$6,500.00	Federal, State, County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Lowndes Co. EMA and Lowndes Co. Board of Education
Total	**$55,400.00**	

Lowndes County Hazard Mitigation Plan Five-Year Cost Summary

Mitigation Objective	FY 07-08	FY 08-09	FY 09-10	FY 10-11	FY 11-12
A-1. Establish full warning system	$109,000.00	$124,000.00	$124,000.00	$124,000.00	$124,000.00
A-2. Ensure adequate protection shelters	$44,000.00	$43,500.00	$43,500.00	$43,500.00	$43,500.00
A-3. Regulations to support hazard mitigation	$27,500.00	$27,500.00	$7,500.00	$7,500.00	$7,500.00
A-4. Fire protection measures	$0.00	$0.00	$0.00	$0.00	$0.00
A-5. Limit impact of heat and drought	$500.00	$500.00	$500.00	$500.00	$500.00
A-6. Improve infrastructure / Remove buildings	$2,500,000.00	$2,500,000.00	$2,500,000.00	$2,500,000.00	$2,500,000.00
A-7. Emergency services	$30,000.00	$30,000.00	$30,000.00	$30,000.00	$30,000.00
B-1. Implementation of Hazard Mitigation Plan	$8,000.00	$8,000.00	$8,000.00	$8,000.00	$12,500.00
B-2. Coordination / Communication among emergency agencies	$1,900.00	$1,900.00	$1,900.00	$1,900.00	$1,900.00
B-3. Assessment Capability	$40,000.00	$34,000.00	$34,000.00	$34,000.00	$34,000.00
C-1. Public awareness program	$1,000.00	$1,000.00	$1,000.00	$6,000.00	$1,500.00
C-2. Disaster prevention education programs	$4,500.00	$10,600.00	$26,100.00	$7,100.00	$7,100.00
Total	**$2,766,400.00**	**$2,781,000.00**	**$2,776,500.00**	**$2,762,500.00**	**$2,762,500.00**
Grand Total					**$13,848,900.00**

Lowndes County Hazard Mitigation Plan Action Prioritization

In considering the appropriate precedence of mitigation activities to undertake, the Lowndes County LEPC reviewed the hazard profiles and prioritization, and the hazard risk assessment and vulnerability analysis. Though no formal cost-benefit analyses were conducted for each of the proposed mitigation actions, the LEPC did consider a variety of factors such as social impact, technical feasibility, financial costs, administrative capabilities, possible political and legal effects, as well as other issues. It was determined by the LEPC that all of the proposed actions would benefit citizens of Lowndes County and each of its municipalities. It was also decided that formal cost-benefit evaluations for specific actions should be completed when and if required (e.g., when applying for certain FEMA grant funds). Following this review and discussion, the following prioritization proposal was completed by the LEPC in order to assist the jurisdictions with the implementation of the Plan.

Mitigation Objective & Action	Hazard	Priority	Target Completion Date
A-1. Establish full warning system			
A-1-a. Installation of warning sirens	Tornados, Hurricanes/Tropical Storms, Severe Storms	High	October 1, 2012
A-1-b. Designate a central emergency coordinator in each community	All	High	October 1, 2007
A-1-c. Warning signage for forest fires	Wildfires	High	October 1, 2012
A-1-d. Investigate phone messaging system	All	High	January 1, 2007
A-2. Ensure adequate protection shelters			
A-2-a. Maintain & expand existing shelters	Tornados, Hurricanes/Tropical Storms, Severe Storms	High	Continuous
A-2-b. Designate and upgrade/retrofit existing public facilities to shelter capability	Tornados, Hurricanes/Tropical Storms, Severe Storms	Moderate	October 1, 2012
A-2-c. Investigate construction of new shelters	Tornados, Hurricanes/Tropical Storms, Severe Storms	Low	Continuous
A-2-d. Secure funds for private shelters	Tornados, Hurricanes/Tropical Storms, Severe Storms	High	Continuous

A-2-e. Work with builders to promote safe rooms	Tornados, Hurricanes/Tropical Storms, Severe Storms	Moderate	Continuous
A-2-f. Publicize shelters	All	High	Continuous
A-3. Regulations to support hazard mitigation			
A-3-a. Incorporate and enforce flood management provisions in all county and municipal regulations and ordinances	Flooding	High	Continuous
A-3-b. Ensure future land use plans do not extend into floodplains.	Flooding	High	Continuous
A-3-c. Develop long-range plan to address permitting and construction in unincorporated areas	All	Moderate	October 1, 2012
A-3-d. Adopt and enforce modern building codes	All	High	Continuous
A-3-e. Lowndes Co. EMA involvement in future development plans	All	Moderate	Continuous
A-3-f. Acquisition of properties in floodplains	Flooding	High	Continuous
A-3-g. Full participation in NFIP	Flooding	High	Continuous
A-4. Fire protection measures			
A-4-a. Develop and utilize zoning ordinances in urban fringe areas	Wildfires	High	Continuous
A-4-b. Education program on fire buffers and breaks	Wildfires	Moderate	January 1, 2007
A-4-c. Support Alabama Forestry Commission education efforts	Wildfires	Moderate	Continuous
A-5. Limit impact of heat and drought			
A-5-a. Implement water conservation and water quality education	Extreme Heat/Drought	Moderate	Continuous
A-5-b. Work with medical providers to develop emergency supplies and education program	Extreme Heat/Drought, All	Moderate	October 1, 2009

A-5-c. Work with Lowndes Co. Farm Agency and County Ext. Svc. To est. a drought information center	Extreme Heat/Drought	Moderate	October 1, 2009
A-5-d. Develop a drought plan and warning system	Extreme Heat/Drought	Moderate	October 1, 2008
A-5-e. Develop print PSAs	Extreme Heat/Drought	Moderate	Continuous
A-6. Improve infrastructure			
A-6-a. Identify roads that are at risk of flood damage	Flooding	Moderate	Continuous
A-6-b. Continue bridge inspections and improvements	Flooding	High	Continuous
A-6-c. Maintain all county roads for emergency services	All	High	Continuous
A-6-d. Buy-out and relocation activities	All	High	Continuous
A-7. Emergency services			
A-7-a. Investigate need for emergency water supply during disasters	All	Moderate	Continuous
A-7-b. Limit non-critical water consumption during droughts	Extreme Heat/Drought	Moderate	Continuous
A-7-c. Inventory emergency response services and asses needs	All	High	October 1, 2007
A-7-d. Establish local reserve funds	All	High	October 1, 2008
A-7-e. Provide grant services	All	Moderate	Continuous
A-7-f. Assess need for and acquire emergency generators	All	High	Continuous
B-1. Implementation of Hazard Mitigation Plan			
B-1-a. Update Lowndes Co. Haz. Mit. Plan every five years	All	Moderate	October 1, 2012
B-1-b. Provide annual public reports on the status of the Plan's implementations	All	Moderate	Continuous
B-1-c. Municipalities to provide assistance for implementing Plan	All	High	Continuous
B-2. Coordination / Communication among emergency agencies			

B-2-a. Designate a central emergency coordinator in each community	All	High	July 1, 2007
B-2-b. Provide for incident command training	All	High	Continuous
B-2-c. Develop a system of providing regular updates to appropriate entities in the County	All	Moderate	Continuous
B-2-d. Investigate need for communications upgrades	All	Moderate	October 1, 2007
B-3. Assessment Capability			
B-3-a. Continue identifying critical facilities and evaluate mitigation techniques for each	All	High	Continuous
B-3-b. Incorporate/develop a GIS	All	High	Continuous
C-1. Public awareness program			
C-1-a. Coordinate with other entities to distribute information	All	Moderate	Continuous
C-1-b. Develop information booth	All	Moderate	October 1, 2010
C-1-c. Create and distribute information magnets	All	Moderate	Continuous
C-1-d. Investigate strategies and coordinate with authorities to educate citizens	Pandemic Influenza	Moderate	October 1, 2008
C-2. Disaster prevention education programs			
C-2-a. Develop land management course/training with the County Ext. Sys.	All	Moderate	October 1, 2010
C-2-b. Develop broadcast PSAs	All	Moderate	October 1, 2010
C-2-c. Develop print PSAs	All	Moderate	October 1, 2010
C-2-d. Lowndes Co. EMA website	All	Moderate	October 1, 2010
C-2-e. Incorporate hazard mitigation into local schools	All	Moderate	October 1, 2009
C-2-f. Coloring and activity books	All	Low	October 1, 2011

VI. PLAN MAINTENANCE AND REVIEW

The Lowndes County Natural Hazard Mitigation Plan was developed with the guidance of the Lowndes County Local Emergency Planning Committee so that the committee would be aware of the plan and its contents and, therefore, could ensure its ongoing implementation, review and amendment, as necessary. The Lowndes County LEPC is a standing committee comprised of members representing each of the local governments located in Lowndes County, along with both public and private representatives that have a vital stake in emergency management. The Lowndes County LEPC will meet on a regular basis for other emergency management matters. The continued review and update of the Lowndes County Natural Hazard Mitigation Plan shall become an additional responsibility of the Lowndes County LEPC.

The plan is developed on a five-year time frame. It is intended to be reviewed on an annual basis for any necessary amendments, and to undergo a major review and update every five years. In this way, Lowndes County will have an ongoing mitigation plan and process.

The Lowndes County EMA staff will continue to serve as the LEPC's facilitator responsible for holding regularly scheduled meetings, assigning specific tasks necessary to monitor and update the plan to Committee members, and serving as the Committee's liaison with those assigned implementation responsibilities. The facilitator will also serve as the Committee's liaison with participating municipalities and the County Commission. New committee members may be nominated by the EMA Coordinator and then approved by the entire committee.

After the initial Lowndes County Natural Hazard Mitigation Plan is finalized and adopted, the LEPC shall meet at least once per year to review and update the plan, as necessary.

- Each member or a designated alternate must attend at least one meeting a year.
- A list of completed and ongoing mitigation projects will be reviewed at each meeting.

- Previously implemented mitigation actions will be evaluated for effectiveness.
- There will be an update on the status of current mitigation projects.
- Changing land use patterns and new developments will be addressed.
- Any additions or changes in risk assessment and/or risk vulnerability will be identified.
- Any other concerns will be addressed, possible future mitigation plans discussed, and any new projects will be adopted.

The facilitator will schedule the meetings at a time and location convenient to all of the LEPC members. All meetings will be advertised in the local newspaper and open to the public for their comments and suggestions.

In the event that modifications to the plan are required, the LEPC will oversee, recommend, and/or approve all revisions and amendments to the Lowndes County Natural Hazards Mitigation Plan. The LEPC will then submit all revisions, except for mitigation projects or activities not of a countywide nature, for adoption (via signed resolutions) by all of the jurisdictions. Any new projects or activities (developed and/or proposed prior to the first five-year and between subsequent five-year major updates), not of a countywide nature, will be added to the Lowndes County Natural Hazards Mitigation Plan upon recommendation of the LEPC and adoption (via signed resolution) by the appropriate governing body where the proposed project is to be located.

In the event that emergency modifications to the plan are required **and** if Lowndes County and/or any of the jurisdictions located therein are involved in an active disaster declaration at the time the modifications are needed, and if the LEPC is unable to meet in a timely fashion and prior to any AEMA and/or FEMA deadlines in order to conduct the revision and amendment process outlined in the immediately preceding paragraph above, then the Lowndes County EMA Coordinator can recommend revisions and amendments to the Lowndes County Natural Hazards Mitigation Plan. The Lowndes County EMA Coordinator can then submit any emergency revisions, except for mitigation projects or activities not of a countywide nature, for written approval by the Lowndes County Commission. The written approval of just the Chairperson of the Lowndes County Commission is acceptable if (1) the membership of the County Commission is unable to meet in a timely fashion and prior to any AEMA and/or FEMA deadlines, **and** (2) assuming that the proposed revisions do not require or involve local financial commitments or expenditures. Any emergency projects or activities, not of a countywide nature, will be added to the Lowndes County Natural Hazard Mitigation Plan upon recommendation of the Lowndes County EMA Coordinator and written approval by the appropriate municipal council where the proposed project or activity is to be located. The written approval of just the mayor of the municipality is acceptable if (1) the membership of the respective municipal

council is unable to meet in a timely fashion and prior to any AEMA and/or FEMA deadlines, **and** (2) assuming that the proposed revisions do not require or involve local financial commitments or expenditures. If any emergency modifications to the plan are required and are adopted or approved without the expressed approval (either via signed resolutions or letters of approval) of the memberships of the appropriate governing bodies, the said governing bodies may reserve the right to express their approval and adoption via a later vote.

A copy of and/or access to any and all adopted plan revisions will be provided to all LEPC members, the County Commission, and each of the municipalities.

At the end of the five-year cycle of the Action Program, the Committee will oversee a major update to the plan that follows the Federal planning criteria in effect at the time of the update. The updated plan will again be submitted to the AEMA and FEMA for approval.

Implementation of the plan will be the responsibility of a number of local governments and agencies. For this reason, two general public workshops were held to inform citizens about the contents of the plan. For each mitigation action item, a responsible agency has been identified. Furthermore, the implementation of the action items was outlined by year for the first five years. The Lowndes County Emergency Management Agency will coordinate implementation efforts with each of the local governments and with other agencies as necessary.

A critical part of maintaining an effective and relevant natural hazard mitigation plan is ongoing public review and comment. The LEPC is dedicated to direct involvement of the citizens of Lowndes County in providing input on the plan throughout the five-year implementation cycle.

A hard copy of the plan will be available for viewing at all appropriate agencies throughout Lowndes County, at minimum to include: the Lowndes County Emergency Management Agency office, the Lowndes County Clerk's office, the offices of the Clerks of each municipality, and County or municipal government websites, if available. After adoption, a public information notice in the local newspaper will inform the public that the plan may be viewed at these locations.

Public meetings will be held when significant modifications to the plan are required or when otherwise deemed necessary by the LEPC. The public will be able to express their ideas, concerns, and opinions at the meetings. If emergency modifications to the plan are required **and** if Lowndes County and/or any of the jurisdictions located therein are involved in an active disaster declaration at the time the modifications are needed, then this requirement may be waived by the LEPC and/or the appropriate governing bodies of the affected jurisdictions. At a minimum, two public hearings will

be held during the drafting stage of the five-year plan update and to present the final plan to the public before adoption.

If deemed appropriate by the Coordinator of the Lowndes County Emergency Management Agency and once adopted, this plan shall be considered as an Annex to the Lowndes County Emergency Operations Plan, which is administered through the Lowndes County Emergency Management Agency office. In addition to adopting the Lowndes County Natural Hazards Mitigation Plan in its entirety, it is recommended that each adopting jurisdiction incorporate this plan or its elements into their own respective existing or future planning documents, if and when appropriate. Examples of such existing or future planning documents may include, but are not limited to: countywide or municipal comprehensive and/or land use plans and regulations/ordinances; countywide or municipal floodplain management plans; countywide or municipal capital improvement plans and budgets; and any other county or municipal disaster, readiness, and/or contingency plans. The process and/or procedure used by each jurisdiction in adopting and incorporating the Lowndes County Natural Hazards Mitigation Plan or its elements into their own planning documents shall be the same as that delineated in the Code of Alabama and any applicable local ordinances and regulations. The Lowndes County EMA staff and/or the planning staff of the South Central Alabama Development Commission will provide technical assistance when requested.

Appendix A

Documentation of Jurisdictional Adoption

Appendix B

Inventory of Existing Conditions and Supplementary Information

Storm Events

Major storm event data was obtained from the National Climatic Data Center (NCDC) – a subordinate unit of the National Oceanic & Atmospheric Administration (which is itself an agency under the U.S. Department of Commerce). Additional information for tornados was obtained from the Birmingham, Alabama office of the National Weather Service (NWS) – another subordinate unit of NOAA.

Sources:

A. Originators: NCDC, NOAA, DOC
Last Accessed: April 14, 2006
Title: Storm Events for Alabama
Website: http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwEvent~Storms.

B. Originators: Birmingham Office, NWS, NOAA, DOC
Last Accessed: April 14, 2006
Title: Alabama Tornado Database
Website: http://www.srh.noaa.gov/bmx/tornados/index.html.

Query Results

129 event(s) were reported in **Lowndes County, Alabama** between **01/01/1950** and **12/31/2005** (**High Wind limited to speed greater than 0 knots)**.

*Click on **Location or County** to display Details.*

Mag: Magnitude
Dth: Deaths
Inj: Injuries
PrD: Property Damage
CrD: Crop Damage

Alabama

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1 LOWNDES	06/28/1957	0935	Tornado	F2	0	0	25K	0
2 LOWNDES	06/28/1957	1000	Tornado	F1	0	8	250K	0
3 LOWNDES	04/12/1962	0330	Tstm Wind	0 kts.	0	0	0	0
4 LOWNDES	04/29/1963	1815	Tornado	F2	0	0	250K	0
5 LOWNDES	04/28/1964	1830	Tornado	F2	0	0	250K	0
6 LOWNDES	11/10/1966	1230	Tornado	F2	0	0	25K	0
7 LOWNDES	03/06/1967	1825	Tstm Wind	0 kts.	0	0	0	0
8 LOWNDES	04/07/1973	0840	Tstm Wind	0 kts.	0	0	0	0
9 LOWNDES	05/23/1973	2222	Tstm Wind	0 kts.	0	0	0	0
10 LOWNDES	11/26/1973	1740	Tstm Wind	0 kts.	0	0	0	0
11 LOWNDES	02/21/1974	2031	Tstm Wind	51 kts.	0	0	0	0
12 LOWNDES	03/21/1974	0225	Tstm Wind	56 kts.	0	0	0	0
13 LOWNDES	06/12/1974	1840	Hail	0.75 in.	0	0	0	0

14 LOWNDES	06/12/1974	1840	Tstm Wind	0 kts.	0	0	0	0
15 LOWNDES	01/10/1975	1650	Tstm Wind	65 kts.	0	0	0	0
16 LOWNDES	07/23/1976	1915	Tstm Wind	0 kts.	0	0	0	0
17 LOWNDES	04/18/1978	1500	Tornado	F0	0	0	0K	0
18 LOWNDES	11/25/1979	1220	Tornado	F2	0	12	25K	0
19 LOWNDES	07/10/1981	1700	Tstm Wind	0 kts.	0	0	0	0
20 LOWNDES	12/03/1983	1910	Tstm Wind	0 kts.	0	0	0	0
21 LOWNDES	12/03/1983	1914	Tstm Wind	0 kts.	0	0	0	0
22 LOWNDES	12/06/1983	0310	Tstm Wind	0 kts.	0	0	0	0
23 LOWNDES	05/03/1984	0530	Tstm Wind	0 kts.	0	0	0	0
24 LOWNDES	05/03/1984	0630	Tstm Wind	0 kts.	0	0	0	0
25 LOWNDES	05/03/1984	1230	Tstm Wind	0 kts.	0	0	0	0
26 LOWNDES	05/03/1984	1650	Hail	1.75 in.	0	0	0	0
27 LOWNDES	04/15/1985	1230	Hail	0.75 in.	0	0	0	0
28 LOWNDES	05/02/1985	1140	Hail	0.75 in.	0	0	0	0
29 LOWNDES	05/02/1985	1140	Tstm Wind	0 kts.	0	0	0	0
30 LOWNDES	06/07/1985	1855	Tstm Wind	0 kts.	0	0	0	0
31 LOWNDES	09/23/1985	1220	Tstm Wind	0 kts.	0	0	0	0
32 LOWNDES	02/10/1986	1415	Hail	0.75 in.	0	0	0	0
33 LOWNDES	03/12/1986	2240	Tstm Wind	0 kts.	0	0	0	0
34 LOWNDES	03/12/1986	2335	Tstm Wind	0	0	0	0	0

				kts.				
35 LOWNDES	03/12/1986	2335	Tstm Wind	0 kts.	0	0	0	0
36 LOWNDES	03/16/1986	0145	Hail	0.75 in.	0	0	0	0
37 LOWNDES	05/18/1986	1330	Tstm Wind	0 kts.	0	0	0	0
38 LOWNDES	04/25/1988	1630	Hail	0.75 in.	0	0	0	0
39 LOWNDES	04/04/1989	1620	Hail	0.75 in.	0	0	0	0
40 LOWNDES	05/27/1989	1505	Hail	0.75 in.	0	0	0	0
41 LOWNDES	06/14/1989	2100	Tstm Wind	0 kts.	0	0	0	0
42 LOWNDES	02/10/1990	0305	Tstm Wind	0 kts.	0	0	0	0
43 LOWNDES	04/01/1990	1630	Tstm Wind	0 kts.	0	0	0	0
44 LOWNDES	08/20/1990	1800	Tstm Wind	0 kts.	0	0	0	0
45 LOWNDES	03/01/1991	1325	Tstm Wind	0 kts.	0	0	0	0
46 LOWNDES	03/29/1991	0750	Tstm Wind	0 kts.	0	0	0	0
47 LOWNDES	04/29/1991	1100	Tstm Wind	0 kts.	0	0	0	0
48 LOWNDES	03/18/1992	1820	Tstm Wind	0 kts.	0	0	0	0
49 LOWNDES	04/20/1992	1425	Tstm Wind	0 kts.	0	0	0	0
50 LOWNDES	04/20/1992	1430	Tstm Wind	0 kts.	0	0	0	0
51 LOWNDES	07/03/1992	1335	Tstm Wind	0 kts.	0	0	0	0
52 LOWNDES	08/27/1992	1145	Tstm Wind	0 kts.	0	0	0	0
53 LOWNDES	08/27/1992	1245	Tornado	F1	0	2	250K	0
54 LOWNDES	12/04/1993	1345	Thunderstorm	N/A	0	0	0	0

			Winds					
55 LOWNDES	03/27/1994	1245	Hail	1.75 in.	0	0	0	0
56 Hayneville	07/11/1995	1815	Thunderstorm Winds	N/A	0	0	3K	0
57 LOWNDES	08/15/1995	1750	Thunderstorm Winds	N/A	0	0	3K	0
58 ALZ001>050	10/04/1995	1200	Hurricane Opal/high Winds	N/A	2	0	0.1B	10.0M
59 ALZ001>050	12/10/1995	0000	Record Cold	N/A	0	0	0	0
60 ALZ001>050	02/03/1996	06:00 PM	Extreme Cold	N/A	0	0	0	0
61 ALZ001>050	02/23/1996	08:00 AM	Excessive Heat	N/A	0	0	0	0
62 Lowndesboro	03/06/1996	04:55 AM	Tstm Wind	50 kts.	0	0	15K	0
63 ALZ001>050	03/07/1996	08:00 AM	Extreme Cold	N/A	0	0	0	52.0M
64 Hayneville	03/16/1996	12:25 PM	Hail	1.75 in.	0	0	15K	0
65 Gordonsville	03/18/1996	07:12 PM	Tornado	F2	0	2	100K	25K
66 ALZ028>029 - 035>038 - 040>049	12/18/1996	02:00 PM	Winter Storm	N/A	0	0	240K	320K
67 Ft Deposit	06/16/1997	06:35 PM	Hail	0.75 in.	0	0	3K	0K
68 Hayneville	11/21/1997	05:10 PM	Tstm Wind	50 kts.	0	0	35K	0K
69 Countywide	01/07/1998	09:30 AM	Flash Flood	N/A	0	0	25K	5K
70 Lowndesboro	03/08/1998	03:07 PM	Hail	1.00 in.	0	0	0K	0K
71 Lowndesboro	03/20/1998	12:50 AM	Hail	1.25 in.	0	0	0K	0K
72 Hayneville	04/30/1998	03:00 PM	Hail	0.75 in.	0	0	0K	0K
73 Lowndesboro	05/03/1998	02:55 PM	Hail	0.75 in.	0	0	0K	0K
74 Hayneville	06/20/1998	03:44 PM	Tstm Wind	50 kts.	0	0	5K	0K

75 Letohatchee	09/28/1998	01:47 PM	Tornado	F0	0	0	45K	4K
76 Countywide	09/29/1998	05:45 AM	Flash Flood	N/A	0	0	50K	10K
77 Hayneville	03/03/1999	01:11 AM	Tstm Wind	55 kts.	0	0	15K	0K
78 Lowndesboro	01/09/2000	03:25 PM	Hail	0.88 in.	0	0	0K	0K
79 Lowndesboro	03/03/2000	05:45 PM	Funnel Cloud	N/A	0	0	0K	0K
80 White Hall	04/02/2000	05:00 PM	Hail	1.00 in.	0	0	3K	0K
81 Lowndesboro	04/02/2000	05:15 PM	Hail	1.00 in.	0	0	0K	0K
82 Hayneville	08/10/2000	05:45 PM	Tstm Wind	50 kts.	0	0	1K	0K
83 White Hall	08/10/2000	06:30 PM	Tstm Wind	50 kts.	0	0	2K	0K
84 Hayneville	01/19/2001	08:50 AM	Tstm Wind	50 kts.	0	0	3K	0K
85 Countywide	03/03/2001	05:00 PM	Flash Flood	N/A	0	0	18K	0K
86 Countywide	03/12/2001	01:00 PM	Flash Flood	N/A	0	0	5K	0K
87 Countywide	08/06/2001	09:00 AM	Heavy Rain	N/A	0	0	0	0K
88 ALZ037>038 - 040 - 042>049	01/02/2002	06:16 AM	Heavy Snow	N/A	0	0	0K	0K
89 Lowndesboro	04/30/2002	01:15 PM	Hail	1.00 in.	0	0	0K	0K
90 ALZ011>015 - 017>050	01/24/2003	12:00 AM	Extreme Cold	N/A	1	0	0K	0K
91 Ft Deposit	03/09/2003	07:35 AM	Hail	1.75 in.	0	0	5K	0K
92 Ft Deposit	03/09/2003	08:36 AM	Hail	0.75 in.	0	0	0K	0K
93 Collirene	04/07/2003	01:02 AM	Tstm Wind	55 kts.	0	0	5K	0K
94 Hayneville	04/07/2003	01:15 AM	Tstm Wind	50 kts.	0	0	5K	0K
95 Lowndesboro	04/07/2003	01:45 AM	Tstm Wind	55 kts.	0	0	20K	0K
96 Countywide	04/07/2003	09:00 AM	Flash Flood	N/A	0	0	20K	0K

97 White Hall	04/25/2003	04:40 PM	Hail	1.00 in.	0	0	0K	0K
98 Lowndesboro	04/25/2003	04:55 PM	Hail	1.00 in.	0	0	20K	0K
99 Ft Deposit	05/02/2003	06:30 PM	Hail	0.88 in.	0	0	0K	0K
100 ALZ042	09/16/2004	04:00 AM	High Wind	77 kts.	0	0	3.5M	200K
101 Braggs	10/19/2004	04:40 PM	Tstm Wind	50 kts.	0	0	2K	0
102 Lowndesboro	11/24/2004	06:11 AM	Tstm Wind	52 kts.	0	0	14K	0
103 Lowndesboro	02/22/2005	08:05 PM	Hail	1.00 in.	0	0	0	0
104 Countywide	03/07/2005	07:11 PM	Tstm Wind	50 kts.	0	0	2K	0
105 Lowndesboro	03/26/2005	06:23 PM	Hail	0.88 in.	0	0	0	0
106 Ft Deposit	03/27/2005	02:10 PM	Hail	1.75 in.	0	0	11K	0
107 Ft Deposit	03/27/2005	02:17 PM	Tstm Wind	50 kts.	0	0	4K	0
108 Ft Deposit	03/27/2005	02:59 PM	Hail	1.75 in.	0	0	8K	0
109 Hayneville	03/27/2005	03:22 PM	Hail	0.88 in.	0	0	0	0
110 Ft Deposit	03/27/2005	04:00 PM	Hail	0.75 in.	0	0	0	0
111 Ft Deposit	03/27/2005	04:50 PM	Hail	0.75 in.	0	0	0	0
112 White Hall	03/27/2005	10:41 AM	Hail	0.75 in.	0	0	0	0
113 Braggs	03/30/2005	10:05 PM	Hail	1.75 in.	0	0	18K	0
114 ALZ033 - 040>042 - 044	04/01/2005	12:00 AM	Flood	N/A	0	0	22K	0
115 White Hall	04/21/2005	03:37 PM	Tstm Wind	51 kts.	0	0	3K	0
116 Braggs	04/21/2005	04:10 PM	Hail	1.00	0	0	1K	0

				in.				
117 White Hall	04/22/2005	02:32 PM	Hail	1.75 in.	0	0	5K	0
118 White Hall	04/22/2005	03:18 PM	Hail	1.75 in.	0	0	5K	0
119 Hayneville	04/22/2005	04:10 PM	Hail	1.00 in.	0	0	1K	0
120 Braggs	04/22/2005	04:15 PM	Hail	0.75 in.	0	0	1K	0
121 Ft Deposit	04/22/2005	04:50 PM	Hail	1.75 in.	0	0	4K	0
122 Hayneville	04/30/2005	05:48 AM	Tstm Wind	60 kts.	0	4	100K	0
123 White Hall	04/30/2005	05:52 AM	Tornado	F1	0	1	110K	0
124 White Hall	04/30/2005	05:53 AM	Tstm Wind	55 kts.	0	0	26K	0
125 ALZ013>015 - 017 - 022>025 - 027 - 029>035 - 038>042	06/11/2005	12:00 PM	Strong Wind	N/A	0	0	104K	0
126 ALZ042	07/10/2005	02:00 PM	Tropical Storm	N/A	0	0	250K	0
127 Hayneville	07/10/2005	05:30 PM	Flash Flood	N/A	0	0	2K	0
128 ALZ011>015 - 017>050	08/29/2005	04:00 PM	Tropical Storm	N/A	0	8	34.9M	0
129 Hayneville	11/28/2005	07:59 PM	Hail	1.75 in.	0	0	1K	0
				TOTALS:	3	37	140.820M	62.564M

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National Weather Service Forecast Office

Birmingham, AL

Alabama Tornado Database

Lowndes County Tornadoes (17)

Year	Month	Day	Time (CST)	County	Damage Scale	Path Length (Miles)	Fatalities	Injuries	Location
1998	9	28	1347	Lowndes Storm Information	F0	6.0	0	0	Letohatchee-0.9 S Hayneville Numerous trees downed, one mobile home destroyed, and minor damage to several structures. Remnants of tropical system.
1996	3	18	1912	Lowndes-Montgomery Storm Survey	F2	19.0	0	2	1.5 S Gordensville-3.0 W Dannelly Field Numerous trees downed and mobile homes damaged.
1992	8	27	1245	Lowndes	F1	0.3	0	2	5.0 E Hayneville 6 homes damaged, 1 mobile home destroyed, and 1 mobile home damaged.
1979	11	25	1220	Butler-Lowndes	F2	20.0	0	12	Near Greenville-Fort Deposit-Calhoun-Letohatchie Tornado touched down along highway 185 NW of Greenville, uprooting trees and disrupting electric power. It moved northeastward, touching down intermittently near Fort Deposit, Calhoun and Letohatchie in Lowndes County. 12 people were injured, 6 mobile homes were destroyed, 8 houses had roof damage and 1 barn was destroyed. Two separate funnels were reported by the public at Letohatchie.
1978	4	18	1500	Lowndes	F0	< 1	0	0	Lowndesboro Minor damage to trees.
1966	11	10	1230	Lowndes	F2	2.0	0	0	NE Lowndes county Rope-like tornado destroyed 2 barns. 1 house and a store damaged, with several trees twisted off.
1964	4	28	1830	Lowndes	F2	6.0	0	0	Sandy Ridge-Flatwood One church at Flatwood was demolished. Several homes were severely damaged and considerable timber was destroyed.
1963	4	29	1815	Lowndes-Montgomery	F2	9.0	0	0	2 NW Letohatchee-Tabernacle-Pintlalla 2 homes were destroyed by falling trees. One church and one home were unroofed. Several houses were damaged and numerous farm buildings were damaged or destroyed. Considerable timber damage occurred.
1957	6	28	1000	Lowndes-	F1	25.0	0	8	Fort Deposit-Sprague

				Montgomery					Several trees blown daown along the path. All injuries occurred in the Davenport community.
1957	6	28	0935	Lowndes-Montgomery	F2	13.0	0	0	3 S Hayneville-3 SW Hope Hull Several houses and barns were damaged along the path.
1956	12	23	0050	Lowndes-Elmore-Montgomery-Tallapoosa-Monroe-Wilcox	F2	90.0	0	1	Excel-Reeltown Damage occurred in Searcy, Fort Deposit, Pintlalla, Snowdoun, and Mt Meigs. Considerable damage was reported in each location.
1946	5	16	0230	Lowndes	F2	4.0	0	0	Sandy Ridge Several structures on a farm were damaged.
1940	2	13	1330	Lowndes	F2	0.5	0	3	St. Clair One home was destroyed.
1916	7	6	1500	Lowndes	F2	2.0	0	2	Lowndesboro This hurricane induced tornado destroyed several homes, stores, and a cotton gin.
1909	2	5	1640	Lowndes-Montgomery	F2	10.0	3	40	3 SW Burkeville-9 W Montgomery One person was killed near Burkville. Two others were killed as dozens of tenant homes were destroyed on the Stone and Herbert plantations.
1908	4	24	2100	Lowndes	F2	5.0	2	22	Fort Deposit 50 buildings were demolished.
1897	8	2	1600	Lowndes	F2	2.0	N/A	N/A	3 N of Letohatchee Several small homes and a church were destroyed. Several barns were damaged or destroyed.

Digital Elevation Model

The digital elevation model (DEM) map for Lowndes County was prepared using data available from USGS.

A DEM is simply a digital map of elevation data. These maps, a type of DTM (Digital Terrain Model), are raster data meaning that they are made up of equally sized gridded cells each with a unique elevation.

Source:

Map Data Citation

Originators: National Aeronautics and Space Administration (NASA), National Imagery and Mapping Agency (NIMA), German Aerospace Center (DLR), and the Italian Space Agency (ASI)
Publication: 2002
Title: Shuttle Radar Topography Mission (SRTM) Elevation Dataset
Download Site: http://seamless.usgs.gov.

Abstract

The Shuttle Radar Topography Mission (SRTM) aboard the Space Shuttle Endeavour, launched on Feb. 11, 2000. SRTM used the same radar instrument that comprised the Spaceborne Imaging Radar-C/X-Band Synthetic Aperture Radar (SIR-C/X-SAR) that flew twice on the Space Shuttle Endeavour in 1994. SRTM was assigned to collect 3-D measurements of the Earth's surface. To collect the 3-D data, engineers added a 60-meter (approximately 200-foot) mast, installed additional C-band and X-band antennas, and improved tracking and navigation devices. The mission is a cooperative project between NASA, the National Imagery and Mapping Agency (NIMA) of the U.S. Department of Defense and the German and Italian space agencies. It is managed by NASA's Jet Propulsion Laboratory (JPL), Pasadena, CA, for NASA's Earth Science Enterprise, Washington, D.C.

Spatial Reference Information

Geographic Coordinate Units: Decimal degrees
Datum: D_WGS_1984
Ellipsoid: WGS_1984

Historical Tropical Cyclones

The historical tropical cyclones map for Lowndes County was prepared using data available from the National Oceanic and Atmospheric Administration (NOAA).

The map layer depicted on the map contains tracks of all North Atlantic, Caribbean, and Gulf of Mexico subtropical depressions and storms, tropical depressions and storms, and all hurricanes from 1851 through 2004. The storm tracks were created from observations of storm center locations taken every six hours.

Source:

Map Data Citation

Originator: National Oceanic and Atmospheric Administration, National Hurricane Center
Publication: 2005
Title: Historical North Atlantic Tropical Cyclone Tracks
Download Site: http://nationalatlas.gov/hurallm.html.

Supplemental Information

General information on subtropical and tropical cyclones is available from the National Hurricane Center FAQ page at http://www.aoml.noaa.gov/hrd/tcfaq/tcfaqHED.html, and from the Hurricane Basics page at http://www.nhc.noaa.gov/HAW/basics/hurricane_basics.htm.

Spatial Reference Information

Geographic Coordinate Units: Decimal degrees
Datum: North American Datum of 1983
Ellipsoid: GRS1980

Land Use & Land Cover

The land use and land cover (LULC) map for Lowndes County was prepared using National Land Cover Data 1992 (NLCD 92) available from USGS.

NLCD 92 is a land cover classification scheme that has been applied consistently over the conterminous U.S. It is based primarily on the unsupervised classification of Landsat TM (Thematic Mapper) 1992 imagery. Ancillary data sources included topography, census, agricultural statistics, soil characteristics, other land cover maps, and wetlands data. The NLCD 92 classification is provided as raster data with a spatial resolution of 30 meters.

Source:

Map Data Citation

Originators: USGS
Publication: June 1999
Title: Alabama Land Cover Data Set
Download Site:
http://edcwww.cr.usgs.gov/programs/lccp/nationallandcover.html.

Supplemental Information

For descriptions of each classification, please visit
http://landcover.usgs.gov/classes.html.

Spatial Reference Information

Geographic Coordinate Units: Decimal degrees
Datum: North American Datum 1983
Ellipsoid: GRS 80

Landslide Incidence and Susceptibility

The landslide incidence/susceptibility map for Lowndes County was prepared by classifying geographic areas as having high, medium, and low susceptibility to landsliding.

Landslide incidence is defined as the number of landslides that have occurred in a given geographic area. Susceptibility to landsliding is defined as the probable degree of response of geologic formations to natural or artificial cutting, to loading of slopes, or to unusually high precipitation. Generally, it can be assumed that unusually high precipitation or changes in existing conditions can initiate landslide movement in areas where rocks and soils have experienced numerous landslides in the past.

The map units are split into three incidence categories according to the percentage of the area affected by landslides. All of Lowndes County is considered to have low incidence, which means that less than 1.5 percent of the areas have experienced landslides.

Sources:

Text description from "Geologic Hazards Program at the Geological Survey of Alabama", a webpage provided by the Geological Survey of Alabama (GSA), and available from http://www.gsa.state.al.us/gsa/geologichazards/index.html. Last accessed 14 April 2006.

The source for the map data is found below:

Map Data Citation

Originator: Jonathan W. Godt
Publication: February 2001
Title: Landslide Incidence and Susceptibility in the Conterminous United States
Other Citation Details:
These data were originally published as: Godt, J.W., 1997, Digital Representation of Landslide Overview Map of the Conterminous United States: U.S. Geological Survey Open-File Report 97-289, scale 1:4,000,000. Available online at http://landslides.usgs.gov/html_files/landslides/nationalmap/national.html.
Download Site: http://nationalatlas.gov/lsoverm.html.

Map Data Abstract

These data are a digital version of U.S. Geological Survey Professional Paper 1183, Landslide Overview Map of the Conterminous United States. The map and digital data delineate areas in the conterminous United States where large numbers of landslides have occurred and areas, which are susceptible to landsliding. Because the data are

highly generalized, owing to the small scale and the scarcity of precise landslide information for much of the country, they are unsuitable for local planning or actual site selection. This National Atlas data set was previously distributed as Digital Representation of the Landslide Overview Map of the Conterminous United States.

Spatial Reference Information
Geographic Coordinate Units: Decimal degrees
Datum: North American Datum of 1983
Ellipsoid: GRS1980

Expansive Soils/Sinkholes

Large parts of Alabama are underlain by carbonate rocks, such as limestone and dolomite, which are susceptible to solution in the humid southern climate. Movement of ground water along joints and fractures in these soluble rocks results in solution of the rocks and the development of cavities or openings in the rock. A prerequisite for subsidence is the presence of underground openings in rocks or unconsolidated materials. Cavities may form naturally or they may be manmade. The most significant cavities in terms of subsidence in Alabama are solution cavities in carbonate rock terrains, although there are known instances of sinkholes forming over abandoned mines.

Areas in Alabama underlain by carbonate rocks and characterized by the presence of subsurface cavities, sinkholes, and underground drainage are called "karst terrains." It is these karst areas that are most susceptible to sinkhole development and subsidence.

The data used in creating the Landslide and Sinkhole Potential map found earlier in this document is based on GIS information obtained from the Geological Survey of Alabama (GSA).

Sources:

Text description from "Geologic Hazards Program at the Geological Survey of Alabama", a webpage provided by the Geological Survey of Alabama (GSA), and available from http://www.gsa.state.al.us/gsa/geologichazards/index.html. Last accessed 14 April 2006.

The source for the map data is found below:

Map Data Citation

Contacts: Sandy Keller and Dorothy Raymond
Geological Survey of Alabama (GSA)
Publication: April 2006
Title: Limestone/Carbonate Formations in the State

Spatial Reference Information
Geographic Coordinate Units: Decimal degrees
Datum: North American Datum of 1983